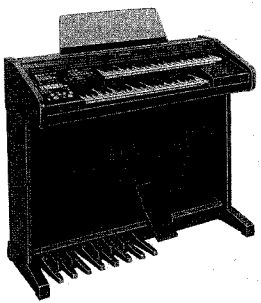
ORDER NO. EMID911353
A4

# Service Manual

Electronic Organ

# SX-EN2



(M), (MC), (XM), (EN), (EH), (EF), (EZ), (EW), (EA), (EP), (EK), (XL), (XR), (XS), (XD), (X)

**AREAS**

| | | | |
|---|---|---|---|
| (M): | U.S.A. | (EK): | the United Kingdom |
| (MC): | Canada | (XL): | New Zealand |
| (XM): | Mexico | (XR): | Australia |
| (EN): | Norway, Sweden, Denmark, Finland | (XS): | Malaysia, Singapore, South Africa |
| (EH): | Holland | (XD): | Saudi Arabia, Kuwait |
| (EF): | France, Italy, Belgium | (X): | the Middle East, Indonesia, Hong Kong, the Philippines, Thailand, Taiwan |
| (EZ): | Germany | | |
| (EW): | Switzerland | | |
| (EA): | Austria | | |
| (EP): | Spain, Portugal, Greece | | |

## ■ Specifications

| | | | |
|---|---|---|---|
| KEYBOARD | | | UPPER KEYBOARD 44 KEYS<br>LOWER KEYBOARD 44 KEYS<br>PEDAL KEYBOARD 13 KEYS |
| SOUND GENERATOR | | | PCM |
| MAXIMUM NUMBER OF NOTES PRODUCED SIMULTANEOUSLY | | | 32 NOTES<br>(NUMBER OF NOTES WHICH CAN BE INPUT SIMULTANEOUSLY: UPPER KEYBOARD 8 NOTES, LOWER KEYBOARD 8 NOTES, PEDAL KEYBOARD 1 NOTE) |
| SOUNDS | PARTS | | UPPER KEYBOARD: TAB & ORGAN, POLY, SPECIAL<br>LOWER KEYBOARD: TAB & ORGAN, POLY, SPECIAL |
| | UPPER | POLY, SPECIAL | 20 SOUNDS (10 SOUNDS×2 VARIATIONS)<br>PIANO, ELECTRIC PIANO, HARPSICHORD, GUITAR, ELECTRIC GUITAR, BRASS, SAX/SYNTH BRASS, REED, FLUTE, STRINGS |
| | | TAB | FLUTE 16', 8', 4', 2'<br>PERC 2-2/3' |
| | | ORGAN | 1~5 |
| | LOWER | POLY, SPECIAL | 16 SOUNDS (8 SOUNDS×2 VARIATIONS)<br>PIANO, ELECTRIC PIANO, HARPSICHORD, GUITAR, BRASS, SAX/SYNTH BRASS, REED, STRINGS |
| | | TAB | FLUTE 8', 4', 2' |
| | | ORGAN | ORGAN |
| | BASS | | 8 SOUNDS (4 SOUNDS×2 VARIATIONS)<br>ORGAN, ACOUSTIC, ELECTRIC, SPECIAL |
| | ONE TOUCH REGISTRATION | | ○ |

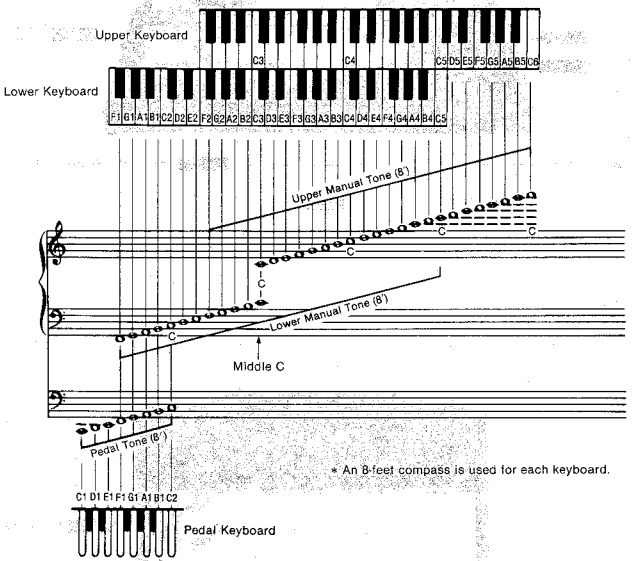
| | | |
|---|---|---|
| EFFECTS | SUSTAIN | UPPER, LOWER, BASS |
| | EFFECT | UPPER, LOWER, BASS |
| | TOUCH | UPPER, LOWER |
| | GLIDE | UPPER |
| | TREMOLO | UPPER TAB & ORGAN, LOWER TAB & ORGAN<br>(SLOW/FAST) |
| RHYTHM | RHYTHM | 24 RHYTHMS (12 RHYTHMS×2 VARIATIONS)<br>MARCH, COUNTRY, WALTZ, SWING 1, 2, LATIN 1, 2, 8 BEAT, ROCK, 16 BEAT 1, 2, DISCO |
| | CONTROL | START/STOP, SYNCHRO & BREAK, INTRO & ENDING, FILL IN 1, 2, COUNT INTRO, TEMPO |
| | KEYBOARD PERCUSSION | 34 KEYS |
| AUTO PLAY CHORD | | AUTO PLAY CHORD (FINGERED 1, 2, MEMORY), ONE TOUCH PLAY, MUSIC STYLE ARRANGER |
| TECHNI-CHORD | | ○ |
| DISPLAY | | ○ (LCD) |
| DEMO | | ○ |
| SEQUENCER | | STEP RECORD (CHORD)<br>STORAGE CAPACITY: 200 CHORDS |
| MIDI | | CHANNEL, OCTAVE SHIFT, LOCAL CONTROL, START/STOP, MIDI CLOCK, PROGRAM CHANGE MODE, NOTE ONLY, MIDI OUT |
| CONTROL | | VOLUME, TEMPO/PROGRAM, TRANSPOSE |

Technics

# KEYBOARD RANGES

• This manual keyboard features Touch Response, by which you control the volume by playing the keys harder or softer.

Upper Keyboard .....44 Keys
Lower Keyboard .....44 Keys
Pedal keyboard .....13 Keys

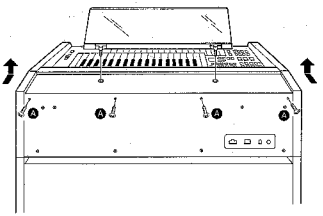

Upper Keyboard
C3
C4
C5 D5 E5 F5 G5 A5 B5 C6
Lower Keyboard
F1 G1 A1 B1 C2 D2 E2 F2 G2 A2 B2 C3 D3 E3 F3 G3 A3 B3 C4 D4 E4 F4 G4 A4 B4 C5
Upper Manual Tone (8')
C
C
C
C
Lower Manual Tone (8')
C
Middle C
Pedal Tone (8')
C1 D1 E1 F1 G1 A1 B1 C2
Pedal Keyboard

* An 8-feet compass is used for each keyboard.

# DISASSEMBLY INSTRUCTIONS

## 1 Removing the top cover

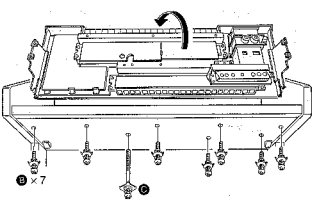
1. Remove the music stand.
2. Remove the top cover holding screws located on the rear board (Ⓐ 4 pcs.).
3. Remove the top cover, sliding it forward and lift.




[Fig. 7]

## 2 Opening the control panel with keyboard unit

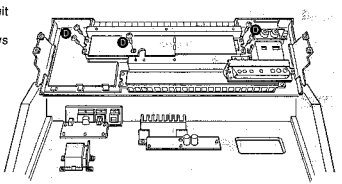
1. Remove the top cover (see step 1).
2. Remove the control panel holding screws located under the upper cabinet (Ⓑ 7 pcs. and Ⓒ 1 pc.).
3. The control panel with keyboard unit can now opened upwards.




[Fig. 8]

## 3 Removing the lower keyboard

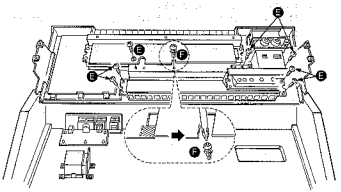
1. Open the control panel with keyboard unit (see step 2).
2. Remove the connectors on the printed circuit boards.
3. Remove the lower keyboard ass'y holding screws (Ⓓ 5 pcs.).
4. The lower keyboard ass'y can be removed.




[Fig. 9]

## 4 Removing the upper keyboard

1. Open the control panel with keyboard unit (see step 2).
2. Remove the connectors on the printed circuit boards.
3. Remove the upper keyboard ass'y holding screws (B 7 pcs.).
4. Bend the printed circuit board along the scored line and remove the screw (B 1 pc.).
5. The upper keyboard ass'y can be removed.

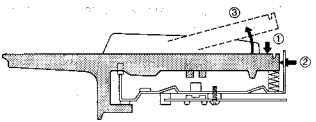


[Fig. 10]

## 5 Removing the keys

1. Remove the keyboard (see step 3 and 4).
2. Press downward on the rear of the key (Fig. 11-①).
3. While pressing downward on the rear of the key, push the key forward and release it from the chassis (Fig. 11-②).
4. Lift the key and remove it from the chassis (Fig. 11-③).

**NOTE:**
To remove a black key, the white key to either side of it should be removed first.



[Fig. 11]

## 6 Removing the ME and MAIN P.C.B.

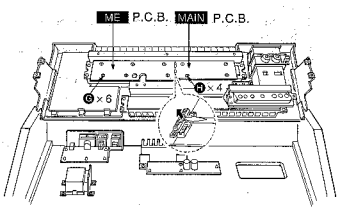
- Open the control panel with keyboard unit (see step 2).

ME P.C.B.

1. Remove the connector which joins the 2 P.C.B.s with a screwdriver as shown in the figure.
2. Remove the ME P.C.B. mounting screws (B 6 pcs.).

MAIN P.C.B.

1. Remove the connector which joins the 2 P.C.B.s with a screwdriver as shown in the figure.
2. Remove the MAIN P.C.B. mounting screws (B 4 pcs.).




[Fig. 12]

## 7 Removing the ACP and AS P.C.B.

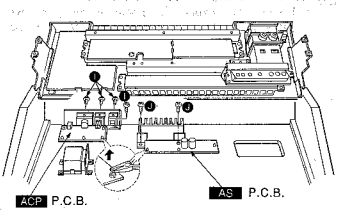
- Open the control panel with keyboard unit (see step 2).

**ACP** P.C.B.

1. Remove the jack mounting screws on the jack panel (J 4 pcs.).
2. Release the 5 claws of the P.C.B. holder to remove the **ACP** P.C.B.

**AS** P.C.B.

1. Remove the **AS** P.C.B. mounting screws (J 2 pcs.).
2. Release the 3 claws of the P.C.B. holder to remove the **AS** P.C.B.

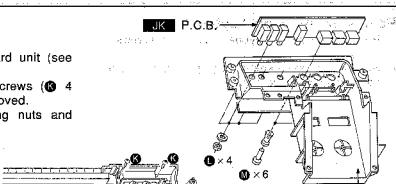



[Fig. 13]

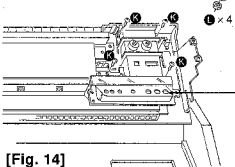
## 8 Removing the JK P.C.B.

**JK** P.C.B.

1. Open the control panel with keyboard unit (see step 2);
2. Remove the jack panel mounting screws (K 4 pcs.). The jack panel can then be removed.
3. Remove the **JK** P.C.B. mounting nuts and latches (L 4 pcs. and M 6 pcs.).



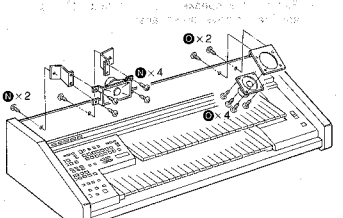

[Fig. 15]




[Fig. 14]

## 9 Removing the speaker

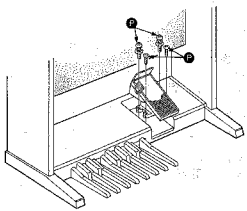
1. Remove the top cover (see step 1).
2. Remove the left speaker mounting screws (O 6 pcs.).
3. Remove the right speaker mounting screws (O 6 pcs.).




[Fig.16]

## 10 Removing the expression pedal

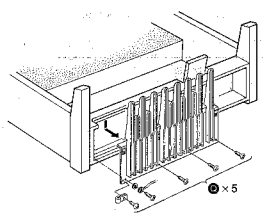
1. Remove the expression pedal mounting screws (P 4 pcs.). The expression pedal can then be removed.




[Fig. 17]

## 11 Removing the pedal keyboard

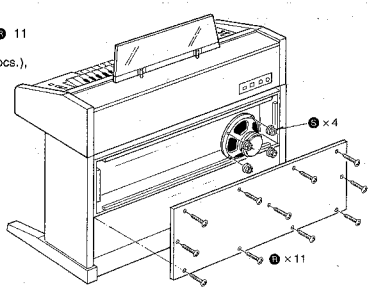
1. Remove the pedal keyboard mounting screws (Q 5 pcs.).
2. Remove the pedal keyboard by pulling in the direction indicated by the arrow.




[Fig. 18]

## 12 Removing the speaker

1. Remove the rear board mounting screws (R 11 pcs.).
2. Remove the speaker mounting nuts (S 4 pcs.), and then remove the speaker.

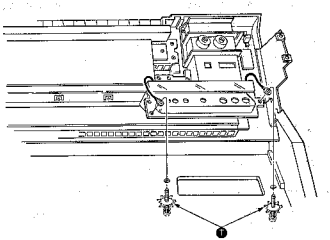



[Fig. 19]

■ **Important:**

**when closing the control panel**

- When closing the control panel, make sure that the JK P.C.B. ground wire is in the position shown in Fig. 20 and affix it securely with screws (Ⓒ 2 pcs.).
- After tightening the screw, please confirm once more that the ground wire is in the proper position.



[Fig. 20]

# MEASUREMENTS AND ADJUSTMENTS

■ **Measuring Equipment**

- Oscilloscope 20 MHz, 10:1 probe/1:1 probe

| ADJUSTMENT | MEASURING CONDITIONS | EQUIPMENT | ADJUSTMENT P.C.B. | ADJ. POINT | CONNECT POINT(S) | READING |
|---|---|---|---|---|---|---|
| D/A Converter offset | any position | Oscilloscope | MAIN P.C.B. | VR1 | Checkpoint Ⓐ | 0V ±5 mV |

1. Set the oscilloscope voltage division to 5 mV/cm (Use the 1:1 oscilloscope probe) and connect the oscilloscope probe to MAIN P.C.B. Checkpoint Ⓐ.
2. Turn VR1 to adjust the voltage to zero.

**MEMO**

# PRECAUTIONS BEFORE SERVICING

## ■ Precautions for measuring of the output waveforms.

1. Set the INITIAL mode before measurement. (Refer to page I-3.)
2. After INITIAL mode, set the measurement conditions as each check points.
3. The waveform was measured with a "National Digital Storage Oscilloscope VP-5730A". Therefore the waveforms of the musical tone signals shown may differ somewhat due to the difference in the timing of the triggering.
4. Since the 1/10 test probe is used, the indicated voltage value on the bottom part of each waveform photo is 1/10 of the actual value (e.g. 0.2V/cm should be 2.0V/cm).

## ■ Important safety notice:

Components identified by a ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only the manufacturer's specified parts.

## ■ Symbolic marks

The symbolic marks for resistors and capacitors used in these circuits are classified following TABLE-1 and TABLE-2.

1. RESISTORS
   - Resistors without a symbolic mark are FIXED CARBON FILM RESISTORS (ERD-type).
   - All resistors are 1/4 WATT, ±5% TOLERANCE unless otherwise designated in the schematic diagrams.

(TABLE-1)

| SYMBOL | SPECIFICATION | SYMBOL | SPECIFICATION |
|---|---|---|---|
| Ⓕ | Fixed Carbon Film Resistors "FLAME-PROOF" (ERD__F__type) | Ⓕ | Fixed Metal Film Resistors "FLAME-PROOF" (ERX__type) |
| Ⓕ | Fixed Wire Wound Resistors "FLAME-PROOF" (ERF__type) | [F] | Fuse Type Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERQ__type) |
| Ⓕ | Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERG__type) | [F] | Fuse Type Fixed Carbon Film Resistors "FLAME-PROOF" (ERD2FC__type) |
| Ⓖ | Fixed Metal Film Resistors (Precision and High Stability) (ERO__type) | | |

2. CAPACITORS
   - Capacitors without a symbolic mark are POLYESTER CAPACITORS. (ECQM-type, ECQG-type, ±10% Tolerance)
   - Polarized capacitors without a symbolic mark are Aluminum Electrolytic Capacitors. (ECEA-type,±20% Tolerance)

(TABLE-2)

| SYMBOL | SPECIFICATION | TYPE |
|---|---|---|
| Ⓝ | Non-Polarized Electrolytic Capacitors | ECEA__KN__type |
| Ⓨ | Non-Polarized Electrolytic (for Network System) | ECEA__Y__type |
| Ⓜ | Aluminum Electrolytic Capacitors (Low leakage current type) | ECEA__M__type |
| Ⓩ | Aluminum Electrolytic Capacitors (Low impedance type) | ECEA__Z__type |
| Ⓣ | Tantalum Solid Electrolytic Capacitors | ECS__type |
| Ⓣ | Metalized Plastic Film Capacitors (TF Series) | ECQV__type |
| Ⓣ | Polyester Film Capacitors | ECQB__type |
| ○ | Temperature Compensating Ceramic Capacitors | ECC__type |
| ○ | High-Dielectric Constant Ceramic Capacitors | ECK__type<br>ECR__type |
| ○ | Ceramic Capacitors (Cylinder type) | ECBA__type |
| | Metalized Polyester Film Capacitors for Across the Line | ECQ__EW__type |
| | Aluminum Electrolytic Capacitors for Smoothing Circuit | ECES__type |

# SYMPTOMS WHICH APPEAR TO BE SIGNS OF TROUBLE

The following changes in performance may occur in the Technics Organ but do not indicate trouble.

| | Symptom | Remedy |
|---|---|---|
| Sounds and effects | The buttons, keys, etc. malfunction. | • Turn off the **POWER** button once, then turn it on again. If this procedure is not successful, turn on the **PROGRAM** button. Then, in the **RHYTHM** section, press and hold the **INITIAL** button until a "beep" tone sounds and the **PROGRAM** indicator goes out (2 or 3 seconds). (Note that, in this case, all programmable settings, functions and memories return to their factory-preset status.) |
| | No sound is produced when the keys are pressed. | • The **MAIN VOLUME** is at the minimum setting. Adjust the volume with the **MAIN VOLUME** control.<br>• The **DEMO** button is on. ("– – –" is shown on the display.) Press the **DEMO** button to turn it off. The display returns to the normal performance display.<br>• The volumes for the selected parts are set to the minimum levels. Use the **VOLUME** buttons to set the volumes of the relevant parts to appropriate levels.<br>• The **LOCAL CONTROL** for a part performed on the keyboard is set to OFF. Set the **LOCAL CONTROL** to on. |
| | Only percussive instrument sounds are produced when the lower keyboard is played. | • The **KEYBOARD PERCUSSION** button is on. Turn it off to return the keyboard to the normal sound. |
| | When the **TAB & ORGAN** is selected, it does not sound. | • If all the **FLUTE** and **PERC** buttons are off while the **TAB** (**FLUTE**) is selected, it does not sound. Turn on a **FLUTE** or **PERC** button to select the sound. |
| | The sound of the lower keyboard or pedal keyboard does not stop. | • This occurs if the lower keyboard is played when the **FINGERED 1** or **2** and the **MEMORY** buttons are on. Turn off the **MEMORY** button. |
| | The foot switch does not operate properly. | • Any function is storable in the foot switch. The default setting is for the glide control. Store your favorite function. |
| Rhythm | The rhythm does not start. | • The **DRUMS** volume is set to the minimum level. Use the **VOLUME** buttons to set the **DRUMS** volume to an appropriate level.<br>• The **MIDI CLOCK** is set the external clock (ON). Set the **MIDI CLOCK** to the internal clock (OFF). |
| AUTO PLAY CHORD | No sound is produced for the automatic accompaniment, or only the sounds of some parts are produced. | • An **ACCOMP** part does not sound if its corresponding volume is set to the minimum level. Use the **VOLUME** buttons to set the **ACCOMP** volume to appropriate levels. |

# MIDI IMPLEMENTATION CHART

**Organ**

**[ SX-EN1/EN2/EN3/EN4 ]** **(Transmitted)**

| Function | | UPPER POLY, SPECIAL (EN2/EN3/EN4), SOLO (EN1/EN4) | LOWER POLY, SPECIAL (EN2/EN3/EN4), SOLO (EN4) | ACCOMP 1, 2, 3 | BASS | DRUMS | CONTROL | Remarks |
|---|---|---|---|---|---|---|---|---|
| **Basic Channel** | Default | 1<br>1~16 | 2<br>1~16 | 5 (1), 9 (2), 10 (3)<br>1~16 | 3<br>1~16 | 15<br>1~16 | 16<br>1~16 | (EN1)<br>memorized (EN2/EN3/EN4) |
| | Changed | ×<br>1~16 | ×<br>1~16 | ×<br>1~16 | ×<br>1~16 | ×<br>1~16 | ×<br>1~16 | (EN1)<br>(EN2/EN3/EN4) |
| **Mode** | Default | 3 | 3 | 3 | 3 | 3 | 3 | OMNI OFF, POLY MODE |
| | Messages | × | × | × | × | × | × | |
| | Altered | --- | --- | --- | --- | --- | --- | |
| **Note Number** | | 0~127 | 0~127 | 0~127 | 0~127 | 0~127 | --- | Changes depending on the position of the transpose control and octave shift. |
| | True voice | --- | --- | --- | --- | --- | --- | |
| **Velocity** | Note ON | ×<br>○ | ×<br>○ | ○*<br>○*** | ○*<br>○*** | ○*<br>○ | --- | (EN1)<br>(EN2/EN3/EN4) |
| | Note OFF | × (9nH:v=0) | × (9nH:v=0) | × (9nH:v=0) | × (9nH:v=0) | × (9nH:v=0) | --- | |
| **After Touch** | Key's | × | × | × | × | × | × | |
| | Ch's | × | × | × | × | × | × | |
| **Pitch Bender** | | ○*<br>○*** | ×<br>○*** | ○*<br>○*** | ○*<br>○*** | ×<br>× | ×<br>× | (EN1/EN2)<br>(EN3/EN4) |
| **Control Change** | 1 | ○*<br>○*** | ×<br>○*** | ○*<br>○*** | ○*<br>○*** | ×<br>× | ×<br>× | modulation (EN1/EN2) (EN3/EN4) |
| | 7 | ○ | ○ | ○ | ○ | ○ | ○ | volume (main volume) |
| | 11 | × | × | × | × | × | ○ | expression pedal |
| | 64 | ○ | ○ | ○ | ○ | × | × | sustain |
| | 80 | × | ○** | × | × | × | × | auto play chord |
| | 82 | × | × | × | × | ○ | × | intro, fill in, ending |
| | 92 | ○** | ○** | × | × | × | × | tremolo |
| | 94 | ○ | ○ | ○ | ○ | × | × | effect |
| **Prog Change** | | ○ | ○ | ○ | ○ | ○ | × | |
| | True # | --- | --- | --- | --- | --- | --- | |
| **System exclusive** | | × | | | | | | |
| **System common** | Song Pos | × | | | | | | |
| | Song Sel | ×(EN1/EN2)<br>○×(EN3/EN4) | | | | | | 0~19 |
| | Tune | × | | | | | | |
| **System Real Time** | Clock | ○ | | | | | | |
| | Commands | ○× | | | | | | start/stop, continue |
| **Aux Messages** | Local ON/OFF | × | × | × | × | × | --- | |
| | All notes OFF | ○ | ○ | ○ | ○ | ○ | --- | |
| | Active Sense | ○ | | | | | | |
| | Reset | × | | | | | | |
| **Notes** | ○* ..... AUTO PLAY CHORD pattern only<br>○** ..... POLY part only<br>○*** ..... AUTO PLAY CHORD or SEQUENCER PLAY only<br>○× ..... Whether or not the data for each of these items is transmitted can be set. | | | | | | | |

**Mode 1:** OMNI ON, POLY **Mode 2:** OMNI ON, MONO ○: Yes

**Mode 3:** OMNI OFF, POLY **Mode 4:** OMNI OFF, MONO ×: No

**Organ**

**[ SX-EN1/EN2/EN3/EN4 ]** **(Recognized)**

| Function | | UPPER POLY, SPECIAL (EN2/EN3/EN4), SOLO (EN1/EN4) | LOWER POLY, SPECIAL (EN2/EN3/EN4), SOLO (EN4) | ACCOMP 1, 2, 3 | BASS | DRUMS | CONTROL | Remarks |
|---|---|---|---|---|---|---|---|---|
| **Basic Channel** | Default | 1 (POLY), 4 (SOLO)<br>1~16 | 2<br>1~16 | 5 (1), 9 (2), 10 (3)<br>1~16 | 3<br>1~16 | 15<br>1~16 | 16<br>1~16 | (EN1)<br>memorized (EN2/EN3/EN4) |
| | Changed | ×<br>1~16 | ×<br>1~16 | ×<br>1~16 | ×<br>1~16 | ×<br>1~16 | ×<br>1~16 | (EN1)<br>(EN2/EN3/EN4) |
| **Mode** | Default | 3 | 3 | 3 | 3 | 3 | 3 | OMNI OFF, POLY MODE |
| | Messages | × | × | × | × | × | × | |
| | Altered | — | — | — | — | — | — | |
| **Note Number** | | 0~127 | 0~127 | 0~127 | 0~127 | 0~127 | — | Changes depending on the position of the transpose control and octave shift. |
| | True voice | 0~127 | 0~127 | 0~127 | 0~127 | 48~81 | — | |
| **Velocity** | Note ON | ○ | ○ | ○ | ○ | ○ | — | |
| | Note OFF | × | × | × | × | × | — | |
| **After Touch** | Key's | × | × | × | × | × | × | |
| | Ch's | × | × | × | × | × | × | |
| **Pitch Bender** | | ○ | ○ | ○ | ○ | × | × | |
| **Control Change** | 1 | ○ | ○ | ○ | ○ | × | × | modulation |
| | 7 | ○ | ○ | ○ | ○ | ○ | ○ | volume (main volume) |
| | 11 | × | × | × | × | × | ○ | expression pedal |
| | 64 | ○ | ○ | ○ | ○ | × | × | sustain |
| | 80 | × | ○** | × | × | × | × | auto play chord |
| | 82 | × | × | × | × | ○ | × | intro, fill in, ending |
| | 92 | ○** | ○** | × | × | × | × | tremolo |
| | 94 | ○ | ○ | ○ | ○ | × | × | effect |
| **Prog Change** | | ○ | ○ | ○ | ○ | ○ | × | |
| | True # | 0~9<br>0~9<br>0~13 | 0~7<br>0~7<br>0~9 | 0~7<br>0~7<br>0~9 | 0~3<br>0~3<br>0~4 | 0~11<br>0~19<br>0~21 | — | (EN1/EN2)<br>(EN3)<br>(EN4) |
| **System exclusive** | | × | | | | | | |
| **System common** | Song Pos | × | | | | | | |
| | Song Sel | ×(EN1/EN2)<br>○×(EN3/EN4) | | | | | | 0~19 |
| | Tune | × | | | | | | |
| **System Real Time** | Clock | ○ | | | | | | |
| | Commands | ○× | | | | | | start/stop, continue |
| **Aux Messages** | Local ON/OFF | × | × | × | × | × | — | |
| | All notes OFF | ○ | ○ | ○ | ○ | ○ | — | |
| | Active Sense | ○ | | | | | | |
| | Reset | × | | | | | | |
| **Notes** | ○*.....AUTO PLAY CHORD pattern only<br>○**.....POLY part only<br>○×.....Whether or not the data for each of these items is received can be set. | | | | | | | |

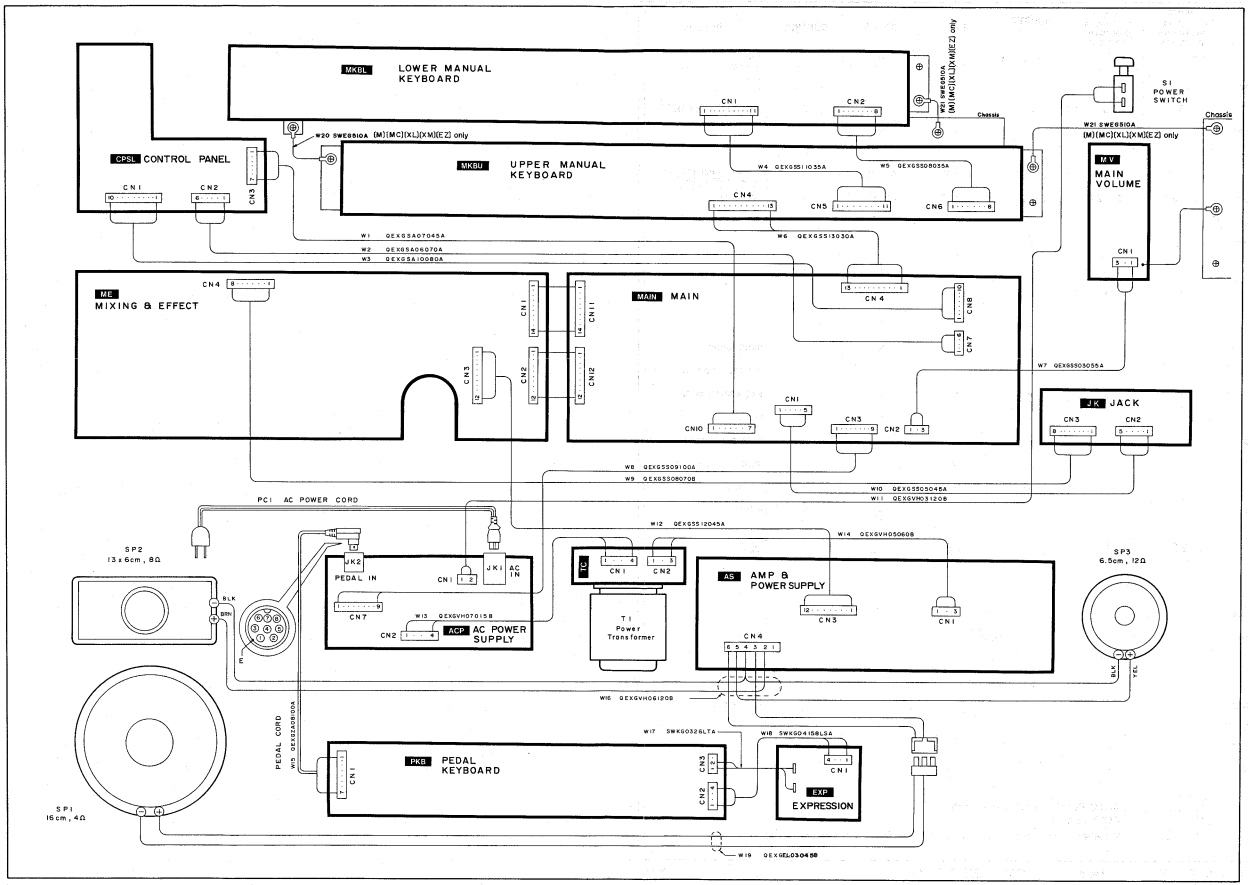
**Mode 1:** OMNI ON, POLY **Mode 2:** OMNI ON, MONO ○: Yes

**Mode 3:** OMNI OFF, POLY **Mode 4:** OMNI OFF, MONO ×: No



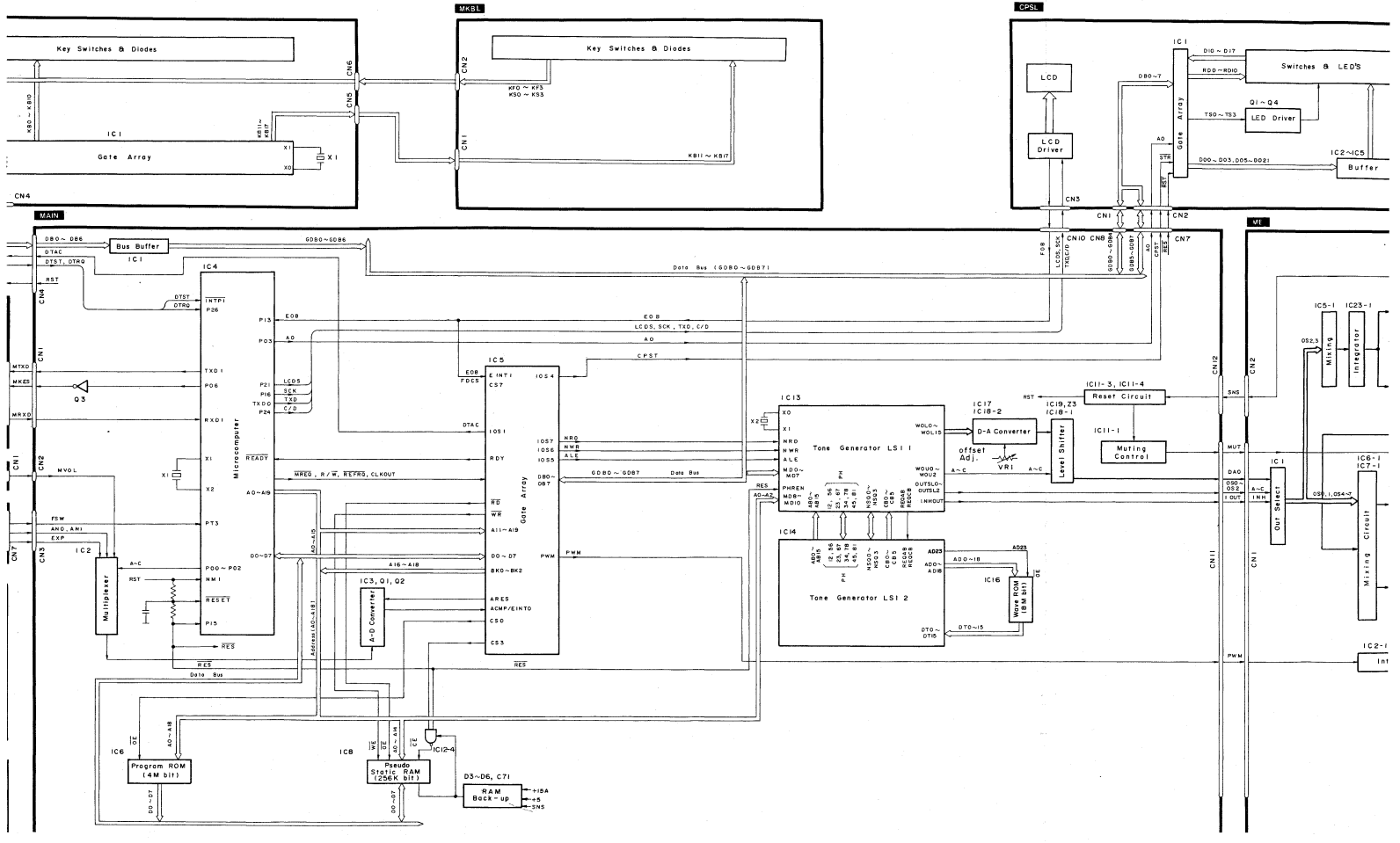
## MEMO

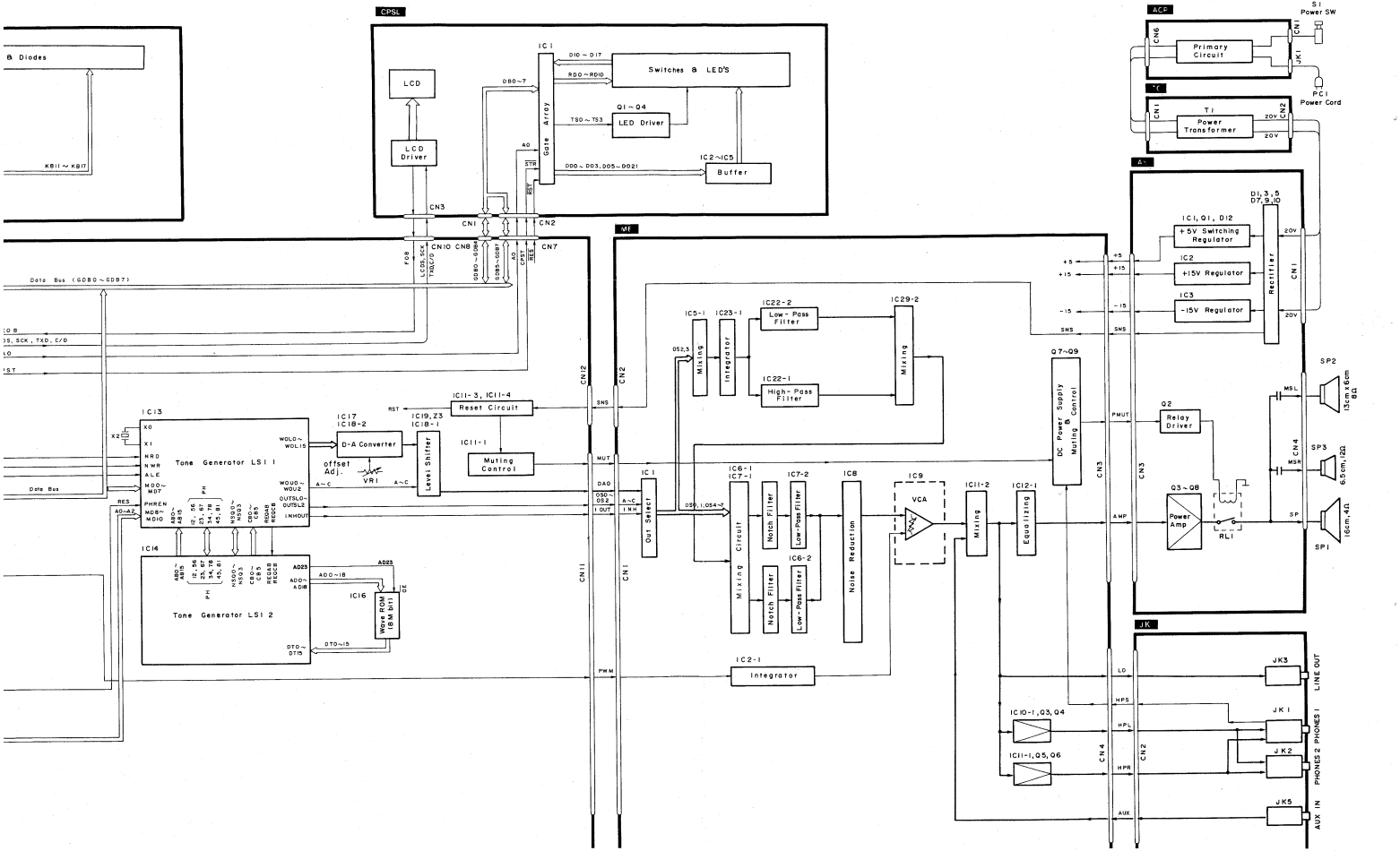
# WIRING CONNECTION DIAGRAM



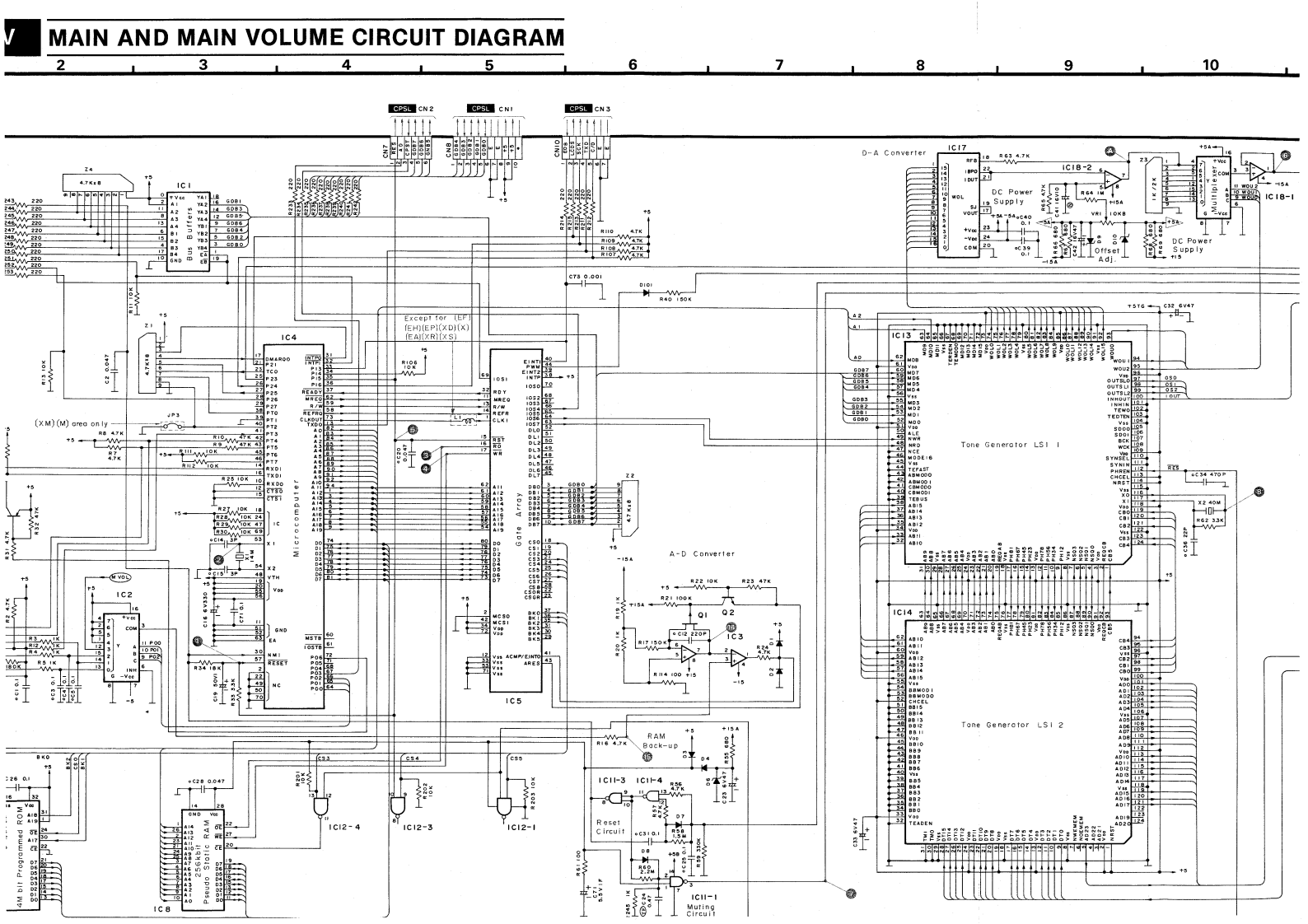
2 3 4 5 6 7 8 9 10

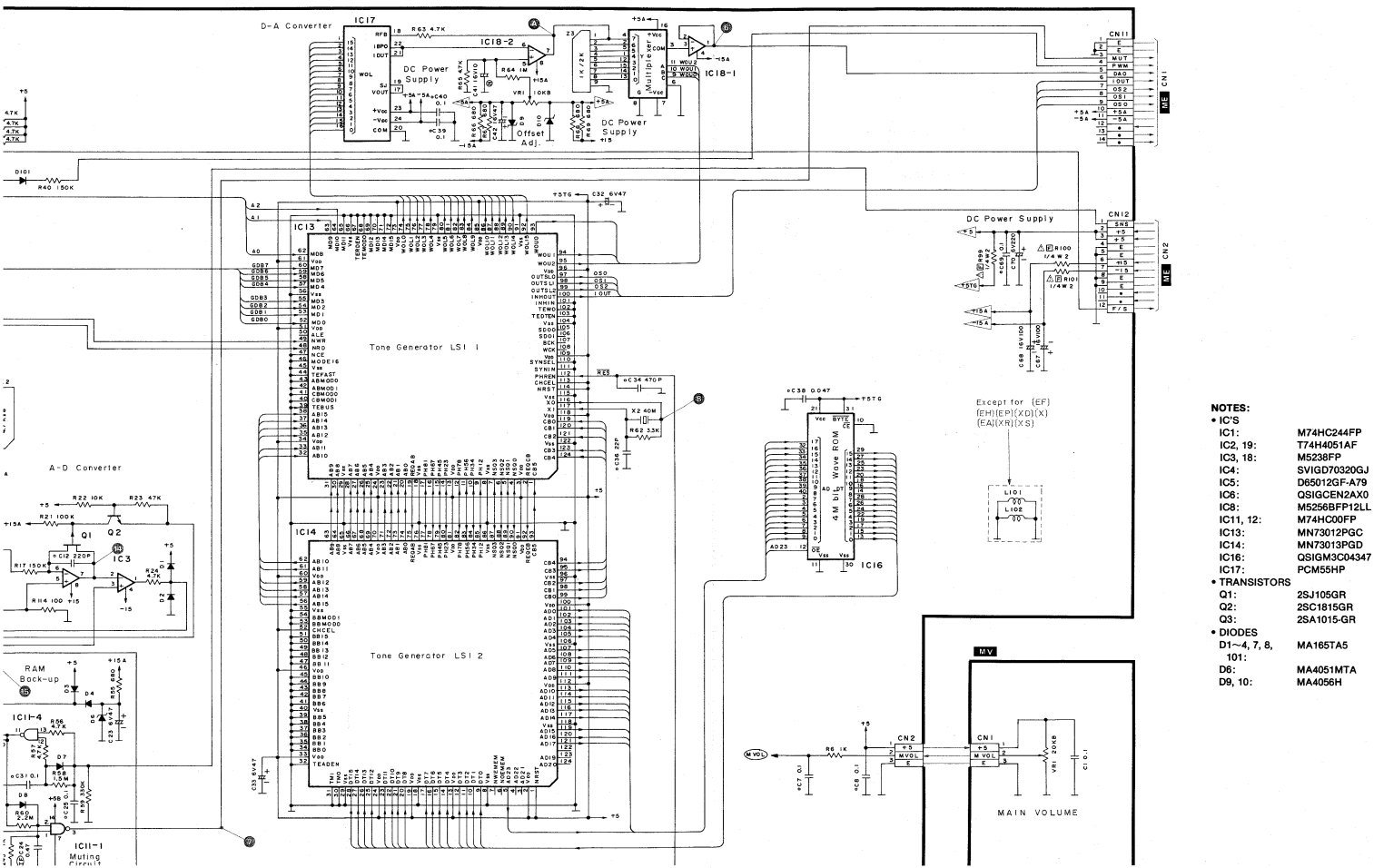
Control Signals




6
7
8
9
10
11
12
13
14
8 Diodes
KB11 ~ KB17
CPSL
LCD
LCD Driver
IC1
D10 ~ D17
RD0 ~ RD10
Switches & LED'S
DB0 ~ 7
Q1 ~ Q4
TS0 ~ TS3
LED Driver
Gate Array
A0
STB
RST
D00 ~ D03, D05 ~ D021
IC2 ~ IC5
Buffer
CN3
CN1
CN2
CN10
CN8
CN7
Data Bus (GDB0 ~ GDB7)
IC13
Tone Generator LSI 1
X0
X1
NRD
NWR
ALE
MD0 ~ MD7
PHREN
MD8 ~ MD11
RES
A0 ~ A2
WOL0 ~ WOL2
WOL3 ~ WOL15
WOU0 ~ WOU2
OUTSL0 ~ OUTSL2
INHOUT
IC17
IC18-2
D-A Converter
offset Adj.
VR1
IC19, Z3
IC18-1
Level Shifter
IC11-3, IC11-4
Reset Circuit
IC11-1
Muting Control
IC14
Tone Generator LSI 2
AD0 ~ AD7
AD8 ~ AD15
AD16 ~ AD18
AD23
IC16
Wave ROM (8M bit)
DT0 ~ DT15
MF
CN12
CN11
SNS
MUT
DAO
OSO, OS2
I OUT
PWM
IC1
Out Select
A ~ C
I NH
IC5-1
Mixing
IC23-1
Integrator
IC22-2
Low-Pass Filter
IC22-1
High-Pass Filter
IC29-2
Mixing
IC6-1
IC7-1
Mixing Circuit
IC7-2
Notch Filter
Low-Pass Filter
IC6-2
Notch Filter
Low-Pass Filter
IC8
Noise Reduction
IC9
VCA
IC2-1
Integrator
IC11-2
Mixing
IC12-1
Equalizing
Q7 ~ Q9
DC Power Supply & Muting Control
CN3
PMUT
AMP
ACP
S1
Power SW
CN6
Primary Circuit
CN1
JK1
PC1
Power Cord
TC
T1
Power Transformer
CN1
CN2
20V
A
D1, 3, 5
D7, 9, 10
IC1, Q1, D12
+5V Switching Regulator
IC2
+15V Regulator
IC3
-15V Regulator
Rectifier
+5
+15
-15
SNS
Q2
Relay Driver
Q3 ~ Q8
Power Amp
RL1
MSL
MSR
CN4
SP
SP2
13cm x 6cm 8Ω
SP3
6.5cm, 2Ω
SP1
16cm, 4Ω
JK
JK3
LINE OUT
JK1
PHONES 2
JK2
PHONES 1
JK5
AUX IN
LO
HPS
HPL
HPR
AUX
IC10-1, Q3, Q4
IC11-1, Q5, Q6
CN4
CN2

# MAIN AND MAIN VOLUME CIRCUIT DIAGRAM






**NOTES:**

- **IC'S**
  - IC1: M74HC244FP
  - IC2, 19: T74H4051AF
  - IC3, 18: M5238FP
  - IC4: SVIGD70320GJ
  - IC5: D65012GF-A79
  - IC6: QSIGCEN2AX0
  - IC8: M5256BFP12LL
  - IC11, 12: M74HC00FP
  - IC13: MN73012PGC
  - IC14: MN73013PGD
  - IC16: QSIGM3C04347
  - IC17: PCM55HP
- **TRANSISTORS**
  - Q1: 2SJ105GR
  - Q2: 2SC1815GR
  - Q3: 2SA1015-GR
- **DIODES**
  - D1~4, 7, 8, 101: MA165TA5
  - D6: MA4051MTA
  - D9, 10: MA4056H

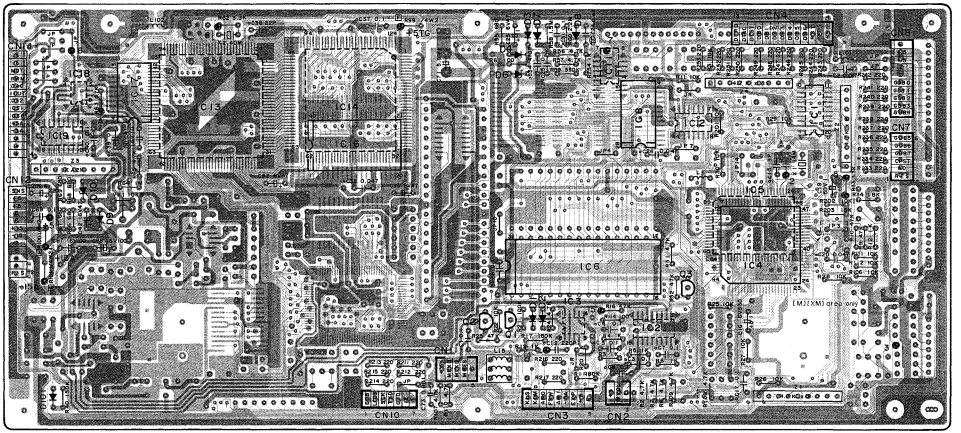
# MAIN AND MAIN VOLUME CIRCUIT BOARD

Circuit view on top of P.C.B.

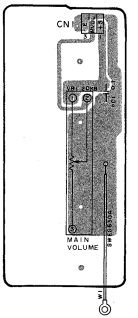
- [M] [XM] areas **SXPG2073231**
- Other areas **SXPG2073211**
- [EF] [EH] [X] [XS] [EA] [EP] [XR] [XD] areas **SXPG2073251**

*Main P.C.B. comparison chart by area.

| Area | P.C.B. No. | JP3 | L1, L15, L101, L102 |
|---|---|---|---|
| M, XM | SXPG2073231 | ○ | ○ |
| EF, EH, EA, EP, X, XR, XS, XD | SXPG2073251 | × | × |
| Other areas | SXPG2073211 | × | ○ |



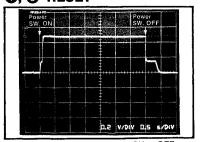
**SXPG207211C**




## ■ Waveform measurement

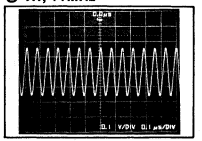
1. Activate the initial setting method. (Refer to page I-3)
2. Set the E. organ to required mode followings.
   - UPPER TAB & ORGAN..... FLUTE 8'——ON
     FLUTE 16' 4' 2'——OFF
     EFFECT——OFF

❶, ❺ **RESET**

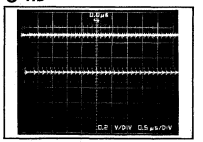



• Power SW.....ON → OFF

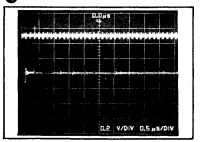
❷ **X1, 14MHz**



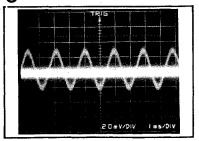
❸ **RD**



❹

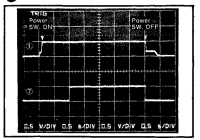


❻



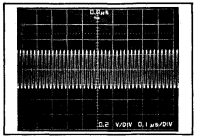
• Upper Keyboard.....C4 Key

❼

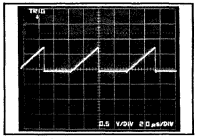



• Power SW.....ON → OFF

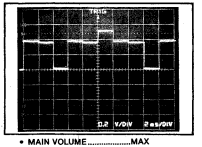
❽ **X2, 40MHz**



❿



⓯

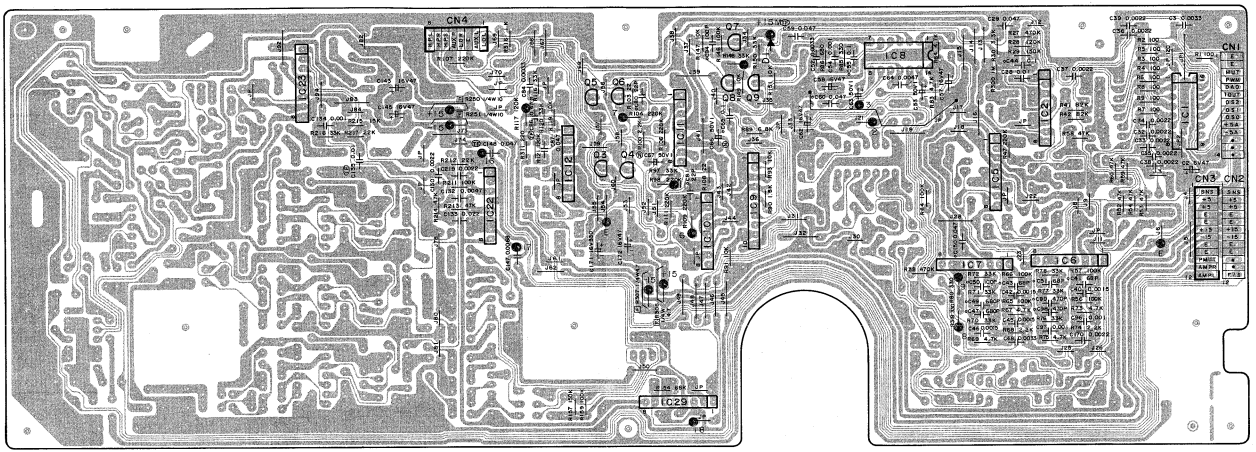


• MAIN VOLUME.....MAX
• EXP. PEDAL.....MAX

# MIXING & EFFECT AND JACK CIRCUIT BOARD

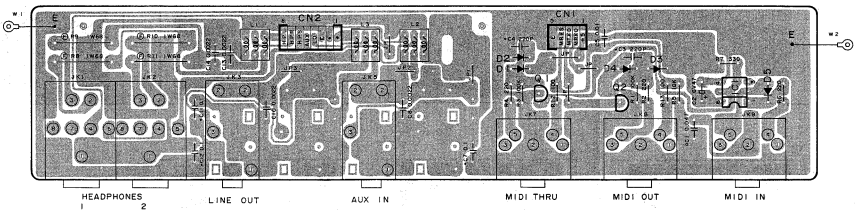
ME

SXPG207531A



JK

SXPG207521B




**JK**

**NOTES:**

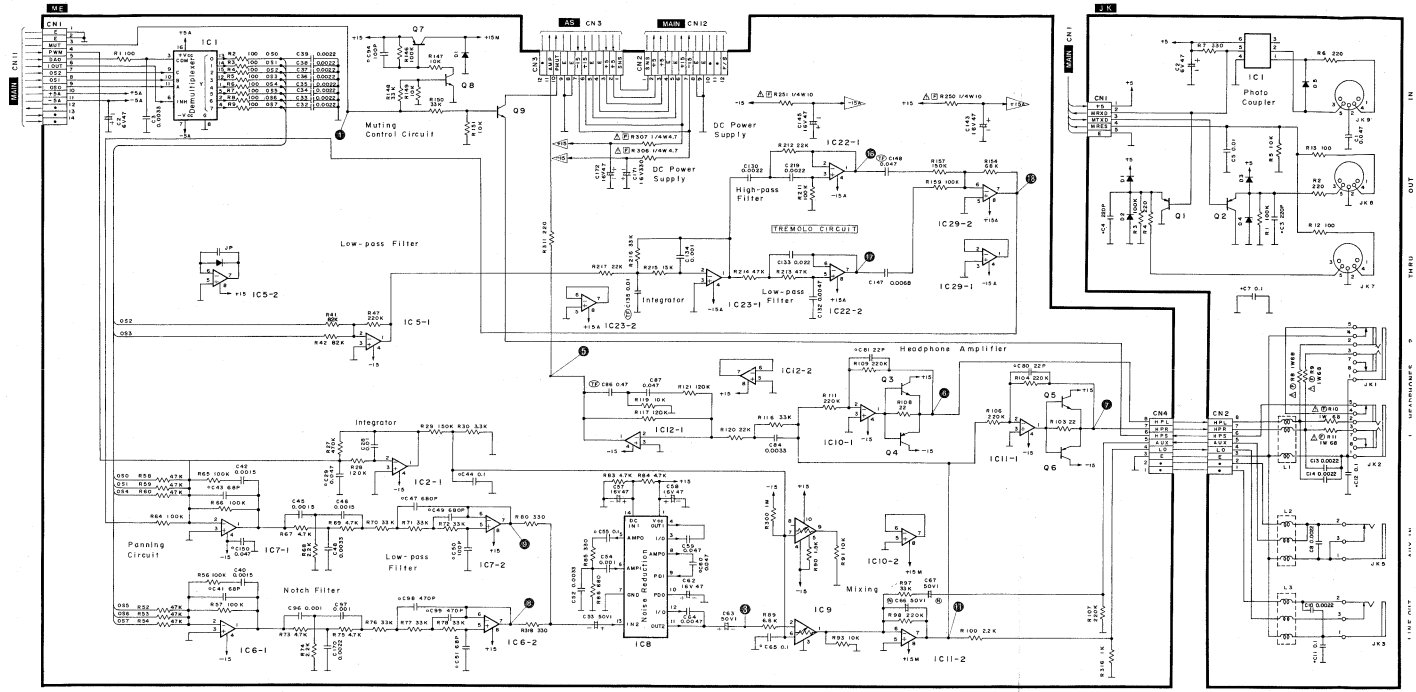
- IC'S
  - IC1: SVIGTLP513
- TRANSISTORS
  - Q1, 2: 2SA1015-GR
- DIODES
  - D1~5: MA165TA5

**ME**

**NOTES:**

- IC'S
  - IC1: SVIGT74H4051
  - IC2, 5~7, 10~12, 22, 23, 29: SVIGM5218L
  - IC8: SVIGLM1894N
  - IC9: SVIGM5241L
- TRANSISTORS
  - Q3, 5: 2SC3940ARS
  - Q4, 6: 2SA1534ARS
  - Q7: 2SA1015-GR
  - Q8, 9: 2SC1815GR
- DIODES
  - D1: EK04

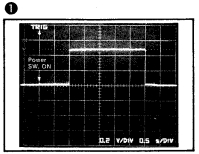
# MIXING & EFFECT AND JACK CIRCUIT DIAGRAM




## ■ Waveform measurement

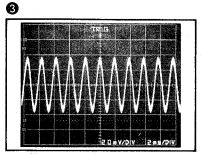
1. Activate the initial setting method. (Refer to page I-3)
2. Set the E. organ to required mode followings.
   - UPPER TAB & ORGAN..... FLUTE 8'——ON
     FLUTE 16' 4' 2'——OFF
     EFFECT——OFF

❶



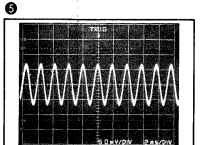

- Power SW.....ON → OFF

❸



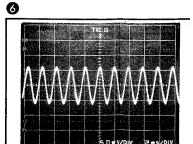

- Upper Keyboard.....C4 Key

❺

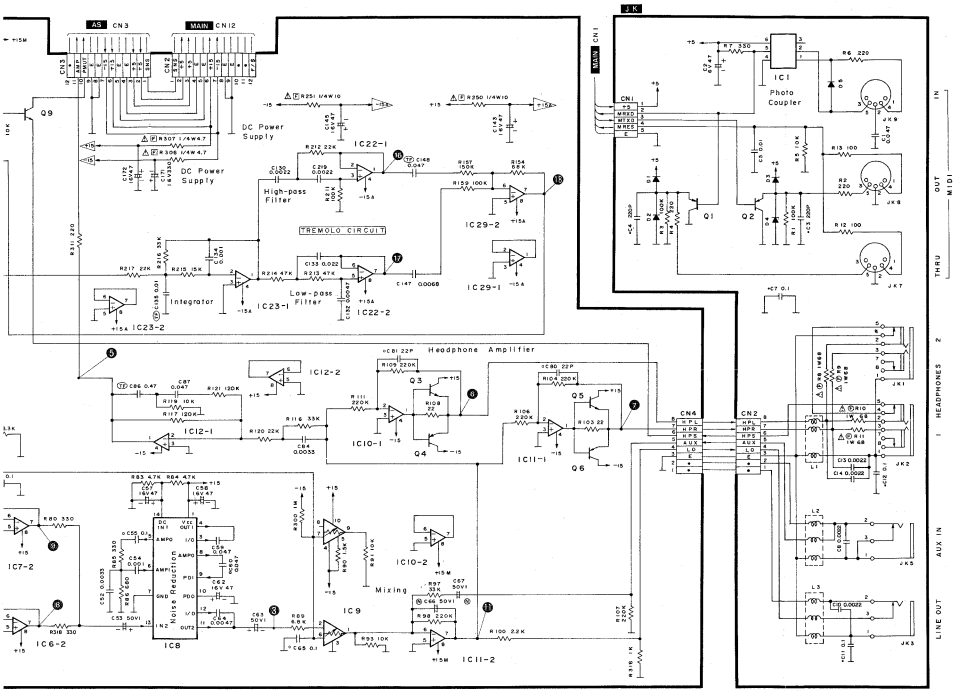



- MAIN VOL.....MAX
- EXP. PEDAL.....MAX
- Upper Keyboard.....C4 Key

❻




- MAIN VOL.....MAX
- EXP. PEDAL.....MAX
- Upper Keyboard.....C4 Key




**ME**

**NOTES:**

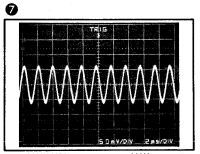
- IC'S
  - IC1: SVIGT74H4051
  - IC2, 5~7, 10~12, 22, 23, 29: SVIGM5218L
  - IC8: SVIGLM1894N
  - IC9: SVIGM5241L
- TRANSISTORS
  - Q3, 5: 2SC3940ARS
  - Q4, 6: 2SA1534ARS
  - Q7: 2SA1015-GR
  - Q8, 9: 2SC1815GR
- DIODES
  - D1: EK04

**JK**

**NOTES:**

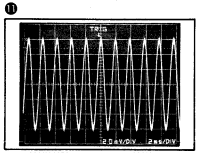
- IC'S
  - IC1: SVIGTLP513
- TRANSISTORS
  - Q1, 2: 2SA1015-GR
- DIODES
  - D1~5: MA165TA5

**7**



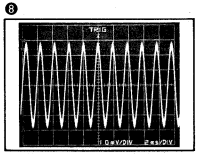

- MAIN VOL. .....MAX
- EXP. PEDAL.....MAX
- Upper Keyboard.....C4 Key

**11**



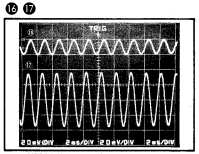

- MAIN VOL. .....MAX
- EXP. PEDAL.....MAX
- Upper Keyboard.....C4 Key

**8**




- Upper Keyboard.....C4 Key

**16 17**

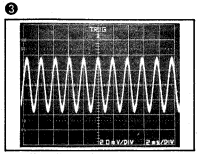



- UPPER TAB & ORGAN.....TREMOLO—ON
- TREMOLO SLOW/FAST....FAST
- Upper Keyboard.....C4 Key

.....ON — OFF



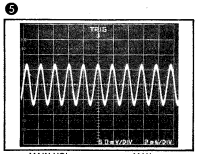
**3**




- Upper Keyboard.....C4 Key

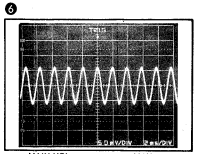


**5**



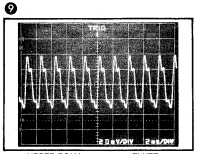

- MAIN VOL. .....MAX
- EXP. PEDAL.....MAX
- Upper Keyboard.....C4 Key

**6**



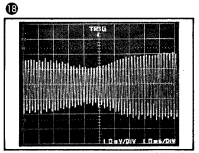

- MAIN VOL. .....MAX
- EXP. PEDAL.....MAX
- Upper Keyboard.....C4 Key

**9**



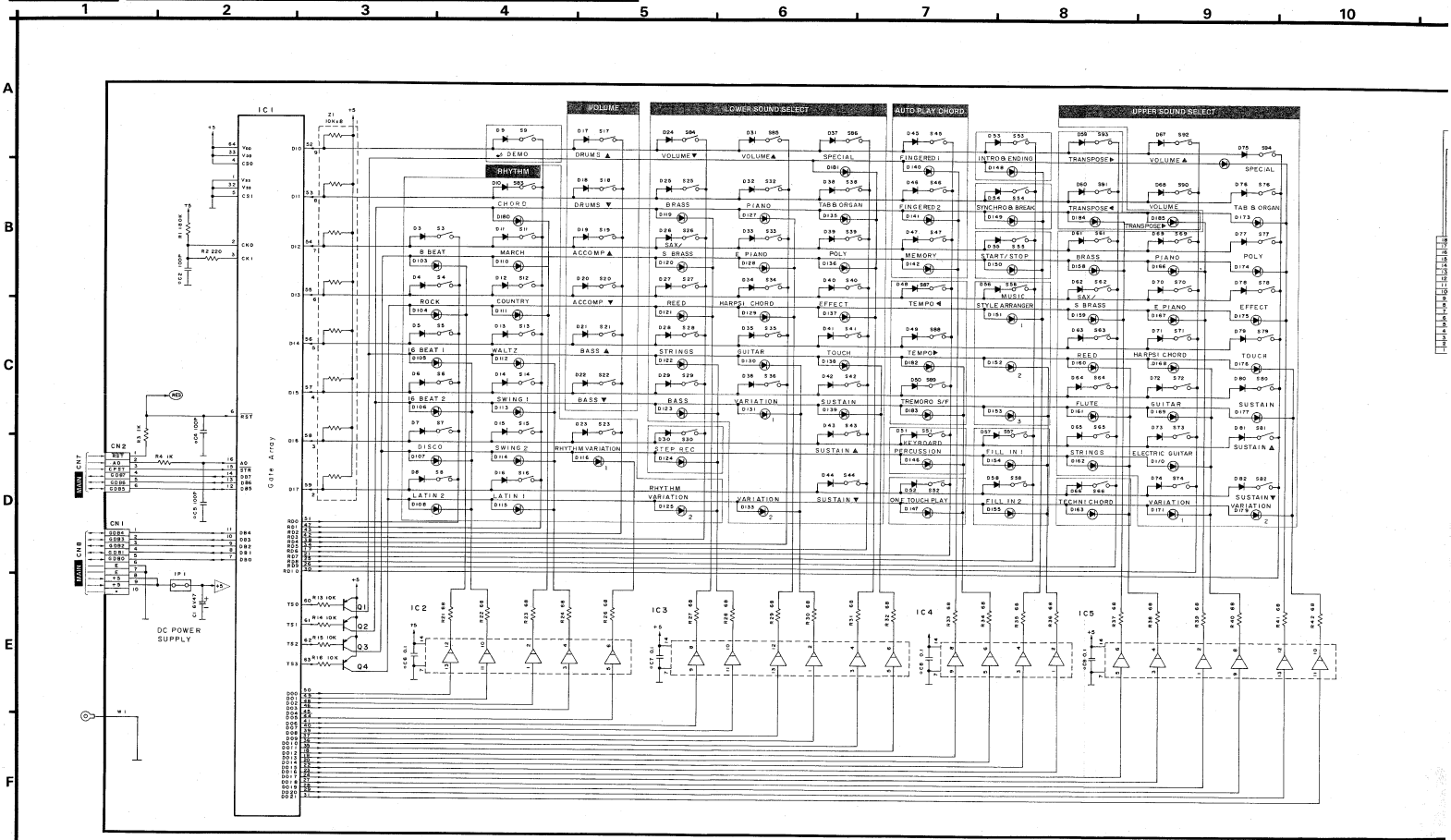

- UPPER POLY .....FLUTE
- Upper Keyboard.....C4 Key

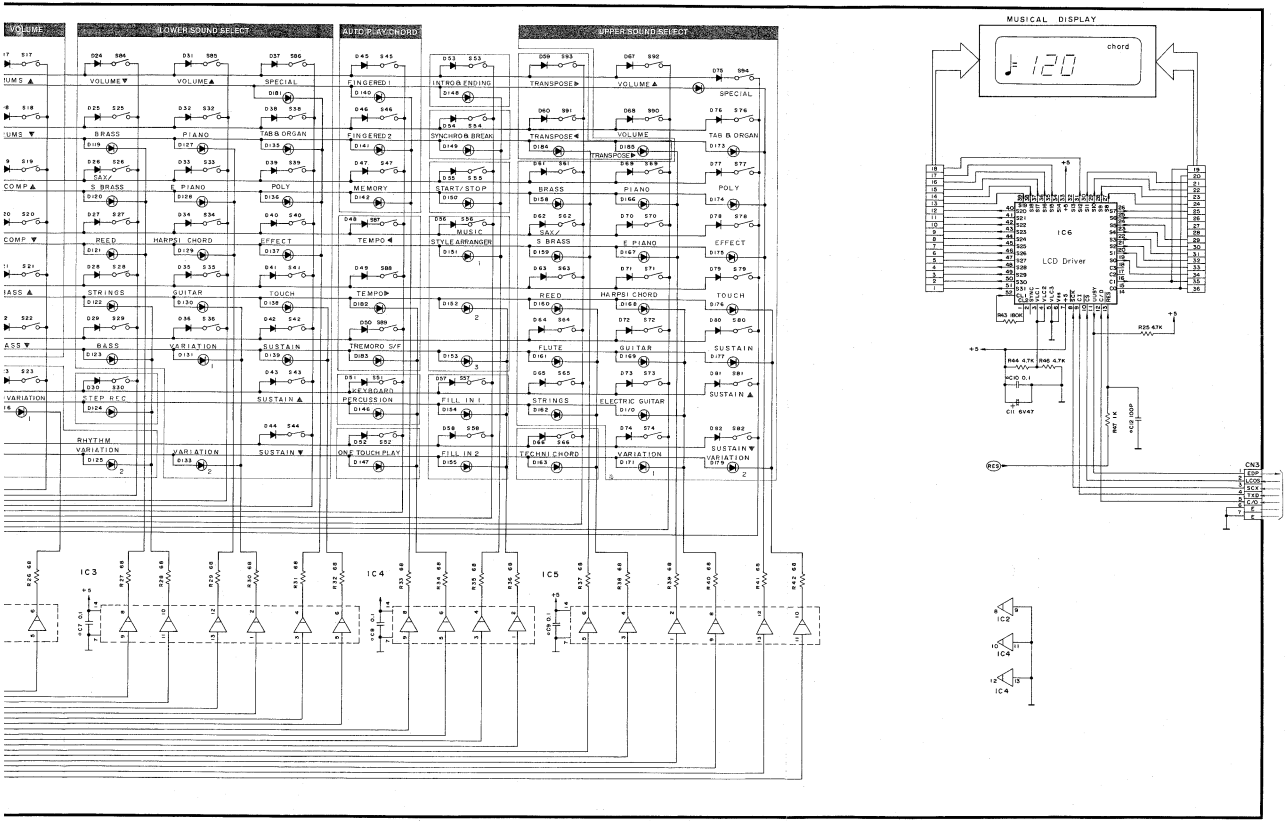
**18**




- UPPER TAB & ORGAN.....TREMOLO—ON
- TREMOLO SLOW/FAST....FAST
- Upper Keyboard.....C4 Key

# CONTROL PANEL CIRCUIT DIAGRAM





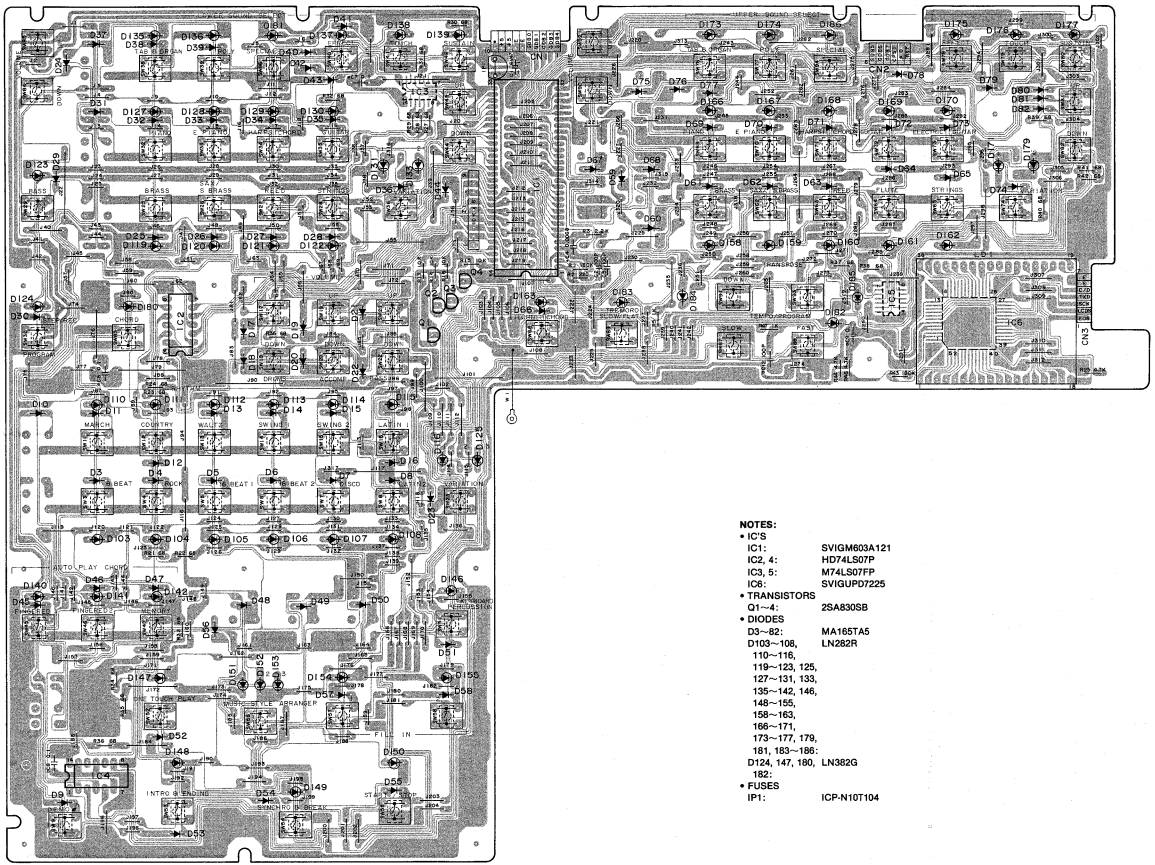

**NOTES:**

- IC'S
  - IC1: SVIGM603A121
  - IC2, 4: HD74LS07P
  - IC3, 5: M74LS07FP
  - IC6: SVIGUPD7225
- TRANSISTORS
  - Q1~4: 2SA830SB
- DIODES
  - D3~82: MA165TA5
  - D103~108, 110~116, 119~123, 125, 127~131, 133, 135~142, 146, 148~155, 158~163, 166~171, 173~177, 179, 181, 183~186: LN282R
  - D124, 147, 180, 182: LN382G
- FUSES
  - IP1: ICP-N10T104

# CONTROL PANEL CIRCUIT BOARD

CPSL

SXPG207231A

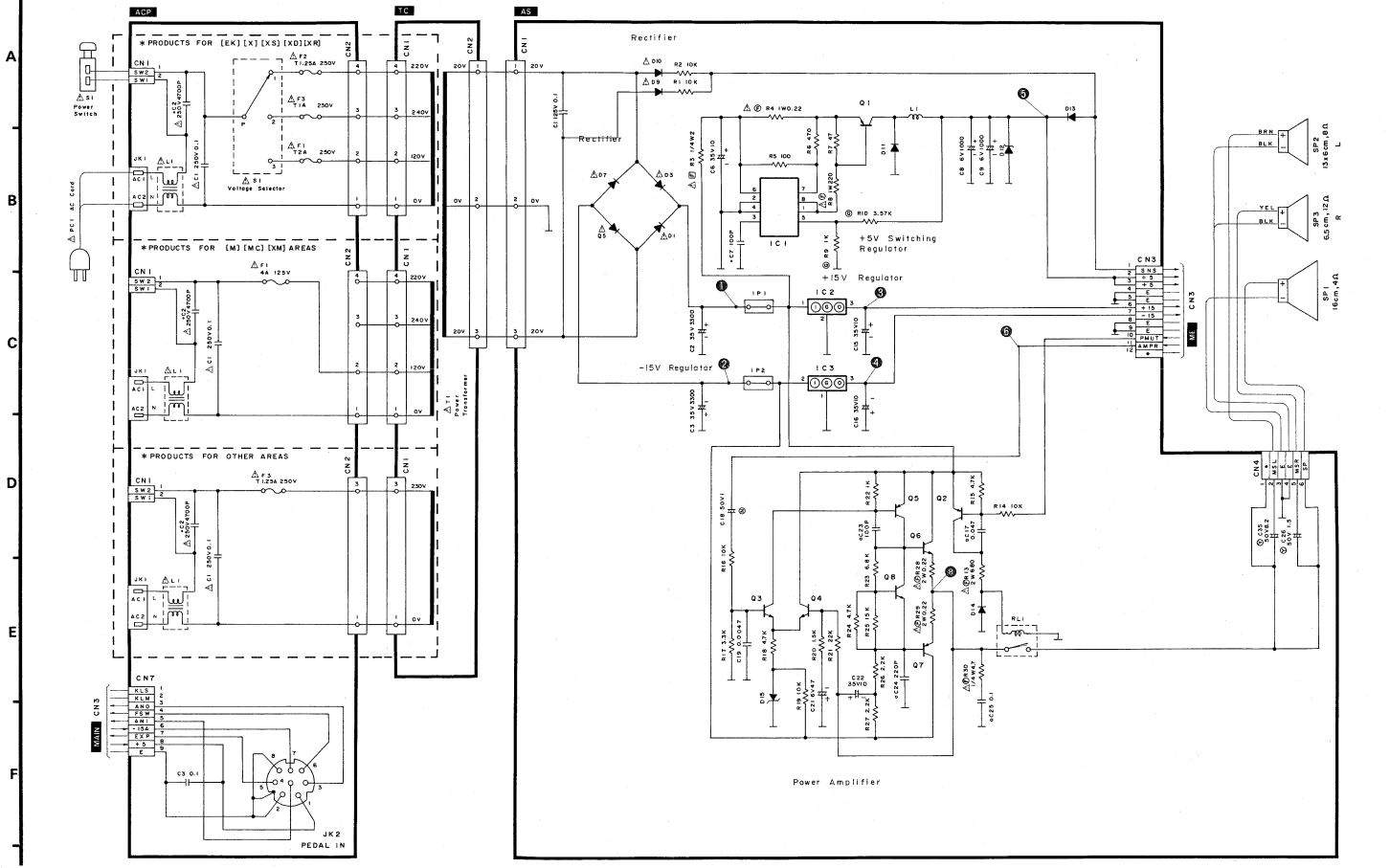


**NOTES:**

- IC'S
  - IC1: SVIGM603A121
  - IC2, 4: HD74LS07P
  - IC3, 5: M74LS07FP
  - IC6: SVIGUPD7225
- TRANSISTORS
  - Q1~4: 2SA830SB
- DIODES
  - D3~82: MA165TA5
  - D103~108, 110~116, 119~123, 125, 127~131, 133, 135~142, 146, 148~155, 158~163, 166~171, 173~177, 179, 181, 183~186: LN282R
  - D124, 147, 180, 182: LN382G
- FUSES
  - IP1: ICP-N10T104

ACP AS

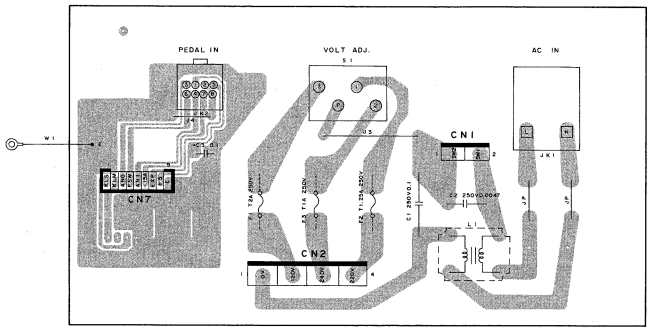
# AC POWER SUPPLY AND AMP & POWER SUPPLY CIRCUIT DIAGRAM




II-21

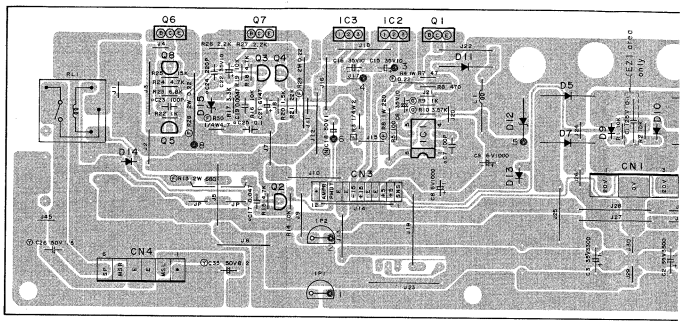
II-22

ACP • [EK] [X] [XS] [XD] areas SXPG209541C • [XR] area SXPG209561C

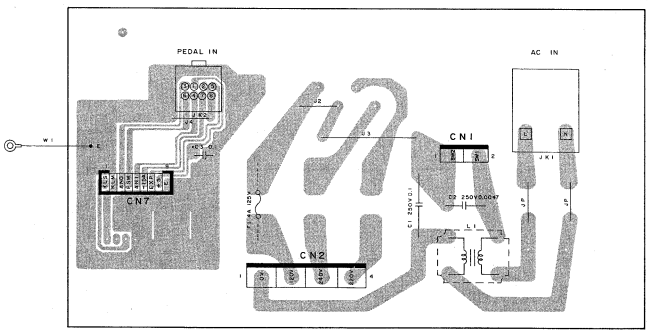



ACP
NOTES:
• FUSES
F1: XBA2C20TB0
F2: XBA2C12TB0
F3: XBA2C10TB0

AS • [EZ] are

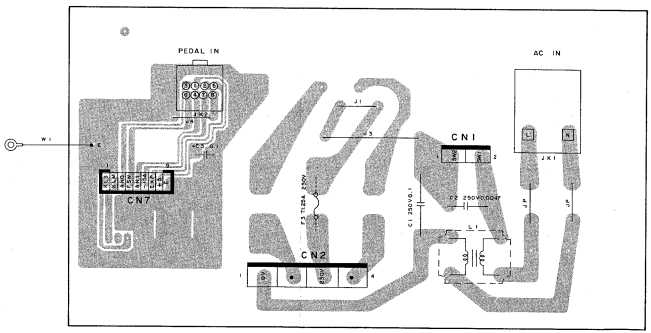



ACP • [M] [MC] [XM] areas SXPG209531C




ACP
NOTES:
• FUSE
F1: XBA1C40NU100

ACP • [XL] area SXPG209551C • Other areas SXPG209511C

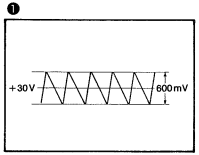



ACP
NOTES
• FUSE
F3:

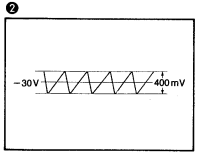
## ■ Waveform measurement

1. Activate the initial setting method. (Refer to page I-3)
2. Set the E. organ to required mode followings.
   • UPPER TAB & ORGAN..... FLUTE 8'——— ON
   FLUTE 16' 4' 2'——— OFF
   EFFECT——— OFF

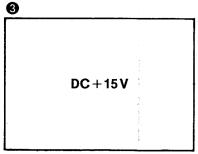
❶



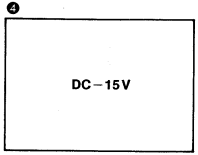

❷




❸




❹

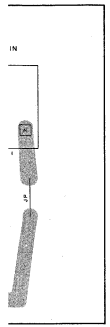



❺

# & POWER SUPPLY CIRCUIT BOARD

5 6 7 8 9 10 11 12 13 14

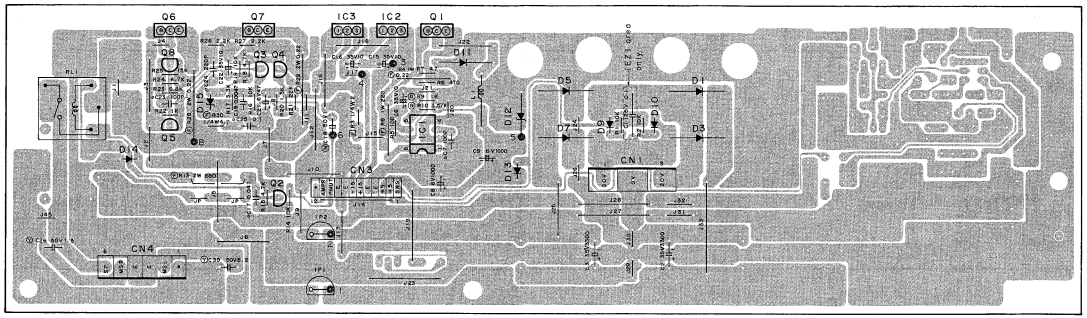
209561C



ACP
NOTES:
• FUSES
F1: XBA2C20TB0
F2: XBA2C12TB0
F3: XBA2C10TB0

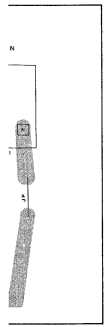
AS

• [EZ] area SXPG2095121A • Other areas SXPG2095111A



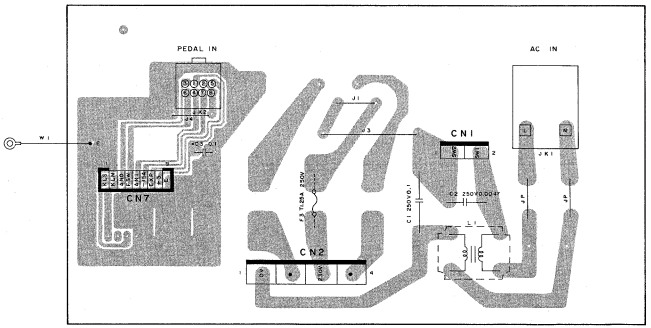

AS
NOTES:
• IC'S
IC1: SVIGM5291P
IC2: SVIGM5F7815
IC3: SVIGM5F7915
• TRANSISTORS
Q1: 2SA1643
Q2: 2SA1015-GR
Q3, 4, 8: 2SC1815GR
Q5: 2SA1123S
Q6: 2SD1277A
Q7: 2SB951A
• DIODES
D1, 3, 5, 7: SVDGS3V20-15
D9, 10: SVDGERA1502
D11: SVDGRK14S
D12: MA2062LF
D13, 14: MA165TA5
D15: MA4062

G209531C



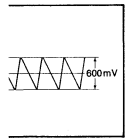
ACP
NOTES:
• FUSE
F1: XBA1C40NU100

ACP • [XL] area SXPG209551C • Other areas SXPG209511C



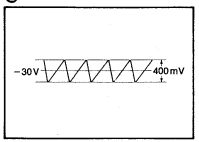

ACP
NOTES:
• FUSE
F3: XBA2C12TB0

❶




II-23

❷




II-24

❸

DC+15V

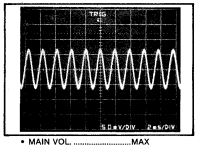
❹

DC−15V

❺

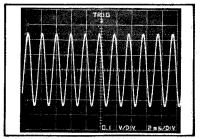
DC+5V

❻




• MAIN VOL. .....MAX
• EXP. PEDAL .....MAX
• Upper Keyboard.....C4 Key

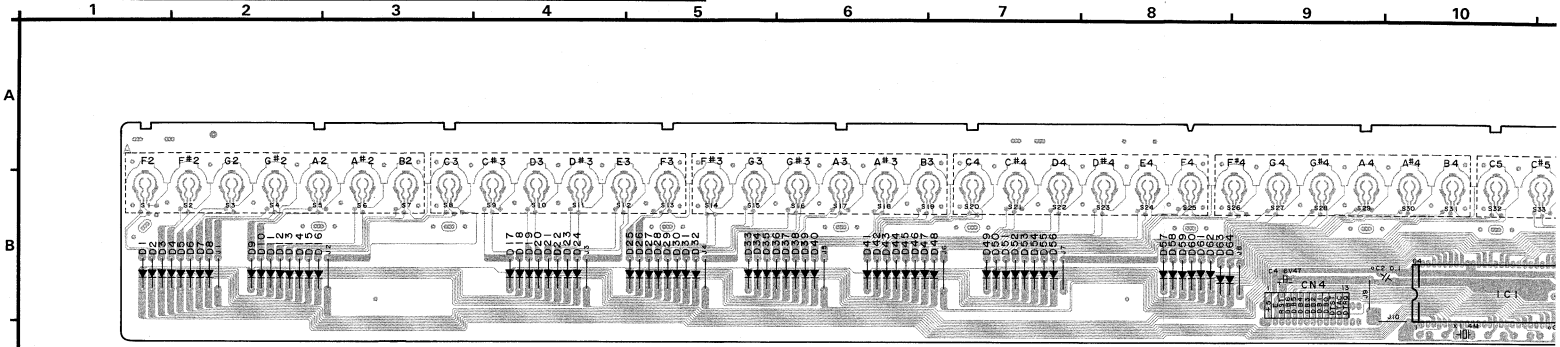
❽



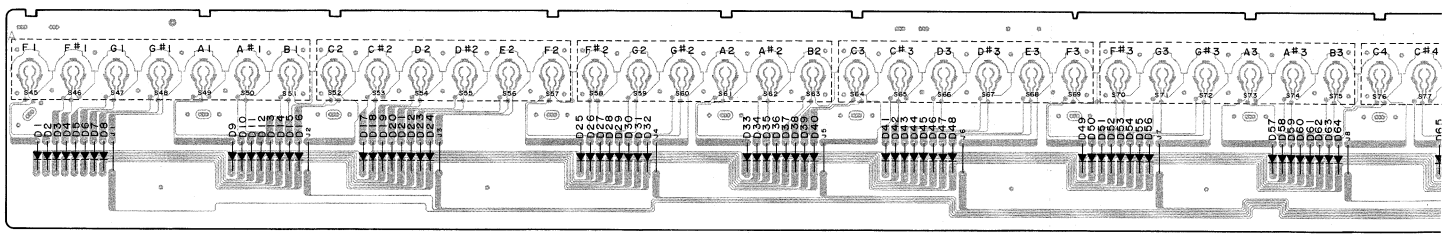

• MAIN VOL. .....MAX
• EXP. PEDAL .....MAX
• Upper Keyboard.....C4 Key

II-25

## MKBU UPPER MANUAL KEYBOARD CIRCUIT BOARD



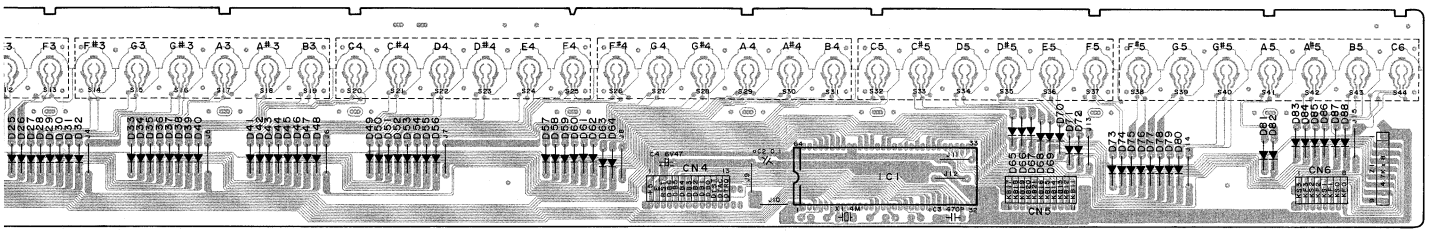

## MKBL LOWER MANUAL KEYBOARD CIRCUIT BOARD



## OARD

5 6 7 8 9 10 11 12 13 14

SXPG207611A



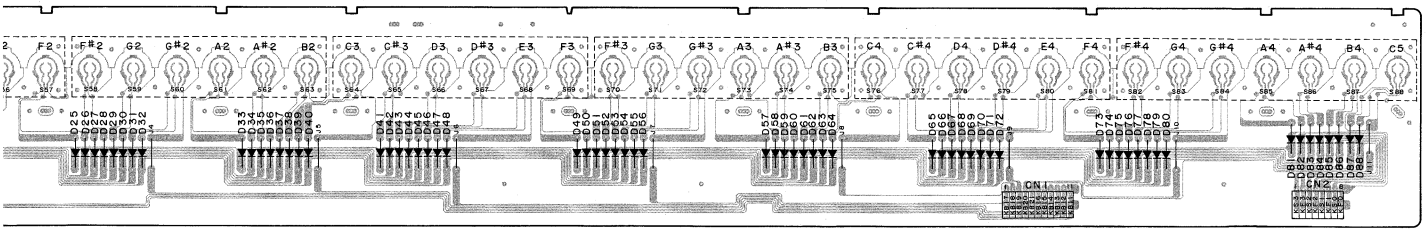

MKBU

**NOTES:**

- IC'S
  IC1: MN50020PGV
- DIODES
  D1~88: MA162A

## IT BOARD

SXPG207611B

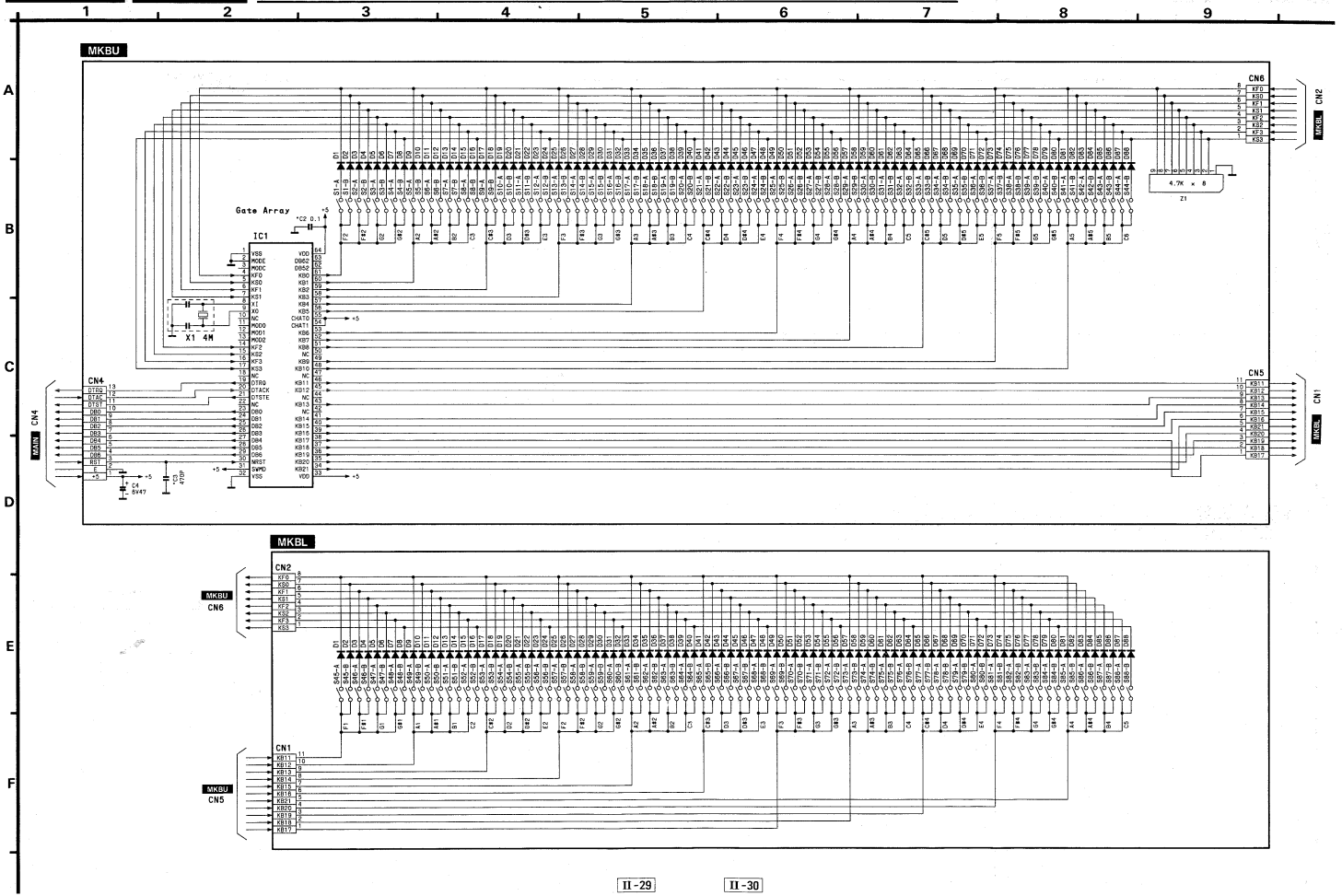


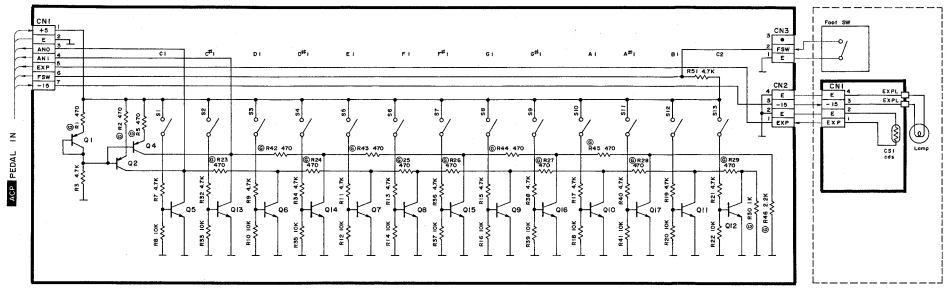

MKBL

**NOTES:**

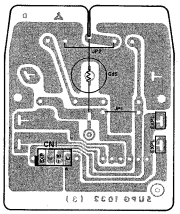
- DIODES
  D89~176: MA162A

# MKBU MKBL UPPER AND LOWER MANUAL KEYBOARD CIRCUIT DIAGRAM






SXPG103211

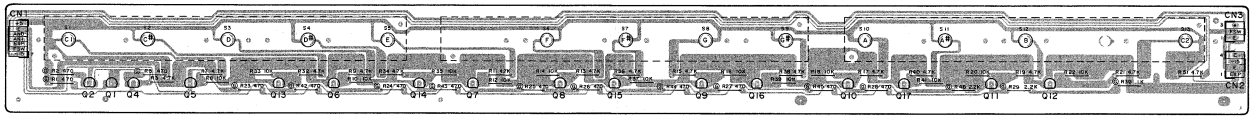


PKB

NOTES:
• TRANSISTORS
Q1, 2, 4: 2SA1015-GR
Q5~17: 2SC2320LFG

## PKB PEDAL KEYBOARD CIRCUIT BOARD

SXPG145111



# REPLACEMENT PARTS LIST.....Cabinet and Chassis Parts

**Notes:**

1. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
2. ○ mark are new parts.
3. For part No. with area mark, check the area when placing an order.
4. Keyboard chassis part No. with mark (NLA) is no longer available after production discontinuation of the complete set.

## ■ PRINTED CIRCUIT BOARD

| | NLA | Area | Part No. | Description | Per/Set |
|---|---|---|---|---|---|
| ○ | NLA | M JM | SXPG2073231 | MAIN | 1 |
| Ⓢ | NLA | Others | SXPG2073211 | MAIN | 1 |
| ○ | NLA | | SXPG207211C | MV | 1 |
| ○ | NLA | | SXPG207531A | ME | 1 |
| ○ | NLA | | SXPG207521B | JK | 1 |
| ○ | NLA | | SXPG207231A | CPSL | 1 |
| ○ | NLA | M JC JH | SXPG209831C | ACP | 1 |
| ○ | NLA | M X AS JH | SXPG209541C | ACP | 1 |
| ○ | NLA | JL | SXPG209551C | ACP | 1 |
| ○ | NLA | JP | SXPG209561C | ACP | 1 |
| Ⓢ | NLA | Others | SXPG209511C | ACP | 1 |
| ○ | NLA | | SXPG2095121A | AS | 1 |
| ○ | NLA | | SXPG207611A | MKBU | 1 |
| ○ | NLA | | SXPG207611B | MKBL | 1 |
| ○ | NLA | | SXPG145111 | PKB | 1 |
| | NLA | | SXPG103211 | EXP | 1 |

## MAIN MAIN CIRCUIT

| | Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|---|
| | | **INTEGRATED CIRCUITS** | | |
| ○ | IC1 | M74HC244FP | 3-State Buffers | 1 |
| | IC2 | T74H4051AF | 8-channel Multiplexer | 1 |
| | IC3 | M5238FP | Operational Amplifier | 1 |
| | IC4 | SVIGD70320GJ | 16 bit Microcomputer | 1 |
| ○ | IC5 | D65012GF-A79 | Gate Array | 1 |
| ○ | IC6 | QSIGCEN2AX0 | 4M bit Programmed EP ROM | 1 |
| ○ | IC8 | M5256BFP12LL | 256K bit static RAM | 1 |
| | IC11, 12 | M74HC00FP | Quad 2-Input NAND Gates | 2 |
| | IC13 | MN73012PGC | Tone Generator LSI 1 | 1 |
| | IC14 | MN73013PGD | Tone Generator LSI 2 | 1 |
| ○ | IC16 | QSIGM3C04347 | 4M bit Wave ROM | 1 |
| ○ | IC17 | PCM55HP | D-A Converter | 1 |
| | IC18 | M5238FP | Operational Amplifier | 1 |
| | IC19 | T74H4051AF | 8-channel Multiplexer | 1 |
| | | **TRANSISTORS** | | |
| | Q1 | 2SJ105GR | FET | 1 |
| S | Q2 | 2SC1815GR | Transistor | 1 |
| S | Q3 | 2SA1015-GR | 2SA933STRS (SUB. Part) | 1 |
| | | **DIODES** | | |
| | D1~4, 7, 8, 101 | MA165TA5 | Diode | 7 |
| | D6 | MA4051MTA | Zener, 5.1 V | 1 |
| | D9, 10 | MA4056H | Zener, 5.8 V | 2 |

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| | **OSCILLATORS** | | |
| X1 | QSXG1A1400A | 14 MHz, Quartz Oscillator | 1 |
| X2 | QSXG1B4000B | 40 MHz, Quartz Oscillator | 1 |
| | **COMPONENT COMBINATIONS** | | |
| Z1, 2, 4 | EXBPI8472JM | 4.7kΩ×8 | 3 |
| Z3 | EXAMR14A1002 | 1kΩ/2kΩ, Ladder Network | 1 |
| | **COILS & LINE FILTERS** | | |
| L1, 101, 102 | QLQGT1B600MA | Coil | 3 |
| L15 | QLQGT3T150SA | Coil | 1 |
| | **SEMI-FIXED RESISTORS** | | |
| VR1 | EVND4AA00B14 | 10kΩ B, | 1 |
| | **RESISTORS** | | |
| R1 | ERDS2TJ184 | 180kΩ | 1 |
| R2 | ERDS2TJ472 | 4.7kΩ | 1 |
| R3 | ERDS2TJ103 | 10kΩ | 1 |
| R4~6 | ERDS2TJ102 | 1kΩ | 3 |
| R7, 8 | ERDS2TJ472 | 4.7kΩ | 2 |
| R9, 10 | ERDS2TJ473 | 47kΩ | 2 |
| R11 | ERDS2TJ103 | 10kΩ | 1 |
| R12 | ERDS2TJ102 | 1kΩ | 1 |
| R16 | ERDS2TJ472 | 4.7kΩ | 1 |
| R17 | ERDS2TJ154 | 150kΩ | 1 |
| R19, 20 | ERDS2TJ102 | 1kΩ | 2 |
| R21 | ERDS2TJ104 | 100kΩ | 1 |
| R22 | ERDS2TJ103 | 10kΩ | 1 |
| R23 | ERDS2TJ473 | 47kΩ | 1 |
| R24 | ERDS2TJ472 | 4.7kΩ | 1 |
| R25~30 | ERDS2TJ103 | 10kΩ | 6 |
| R31 | ERDS2TJ472 | 4.7kΩ | 1 |
| R32 | ERDS2TJ473 | 47kΩ | 1 |
| R33 | ERDS2TJ332 | 3.3kΩ | 1 |
| R34 | ERDS2TJ183 | 18kΩ | 1 |
| R40 | ERDS2TJ154 | 150kΩ | 1 |
| R55 | ERDS2TJ681 | 680Ω | 1 |
| R56, 57 | ERDS2TJ472 | 4.7kΩ | 2 |
| R58 | ERDS2TJ155 | 1.5MΩ | 1 |
| R59 | ERDS2TJ334 | 330kΩ | 1 |
| R60 | ERDS2TJ225 | 2.2MΩ | 1 |
| R61 | ERDS2TJ101 | 100Ω | 1 |
| R62 | ERDS2TJ332 | 3.3kΩ | 1 |
| R63 | ERDS2TJ472 | 4.7kΩ | 1 |
| R64 | ERDS2TJ105 | 1MΩ | 1 |
| R65 | ERDS2TJ472 | 4.7kΩ | 1 |
| R66~69 | ERDS2TJ681 | 680Ω | 4 |
| R99~101 ⚠ | ERQ14AJ2R0 | 2Ω, 1/4W, Fuse Type | 3 |
| R106 | ERDS2TJ103 | 10kΩ | 1 |
| R107~110 | ERDS2TJ472 | 4.7kΩ | 4 |
| R111, 112 | ERDS2TJ103 | 10kΩ | 2 |
| R114 | ERDS2TJ101 | 100Ω | 1 |
| R201~203 | ERDS2TJ103 | 10kΩ | 3 |

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| R211~217 | ERDS2TJ221 | 220Ω | 28 |
| R233~253 | ERDS2TJ221 | 220Ω | 28 |
| R254 | ERDS2TJ102 | 1kΩ | 1 |
| **CAPACITORS** | | | |
| C1 | ECRR1H104ZF | 0.1μF | 1 |
| C2 | ECKR1E473ZV | 0.047μF | 1 |
| C3~5 | ECRR1H104ZF | 0.1μF | 3 |
| C7, 8 | ECRR1H104ZF | 0.1μF | 2 |
| C12 | ECCR1H221J | 220pF | 1 |
| C14, 15 | ECCR1H030C | 3pF | 2 |
| C16 | ECEA0JKA331 | 330μF, 6.3V | 1 |
| C17 | ECRR1H104ZF | 0.1μF | 1 |
| C19 | ECEA1HKA010 | 1μF, 50V | 1 |
| C20 | ECKR1E473ZV | 0.047μF | 1 |
| C23 | ECEA0JKA470 | 47μF, 6.3V | 1 |
| C24 | ECQV1H474JZ | 0.47μF | 1 |
| C25, 26 | ECRR1H104ZF | 0.1μF | 2 |
| C28 | ECKR1E473ZV | 0.047μF | 1 |
| C31 | ECRR1H104ZF | 0.1μF | 1 |
| C32, 33 | ECEA0JKA470 | 47μF, 6.3V | 2 |
| C34 | ECCR1H471J | 470pF | 1 |
| C36 | ECCR1H220J | 22pF | 1 |
| C37 | ECRR1H104ZF | 0.1μF | 1 |
| C38 | ECKR1E473ZV | 0.047μF | 1 |
| C39, 40 | ECRR1H104ZF | 0.1μF | 2 |
| C41 | ECEA1CKN100 | 10μF, 16V | 1 |
| C42 | ECEA1CKA470 | 47μF, 16V | 1 |
| C67, 68 | ECEA1CKA101 | 100μF, 16V | 2 |
| C69 | ECRR1H104ZF | 0.1μF | 1 |
| C70 | ECEA0JKA221 | 220μF, 6.3V | 1 |
| C71 | EECF5R5U105 | 1F, 5.5V, Memory Back-up | 1 |
| C73 | ECQG1H102KZ | 0.001μF | 1 |
| C111, 112 | ECRR1H104ZF | 0.1μF | 2 |

## MV MAIN VOLUME CIRCUIT

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| **VARIABLE RESISTORS** | | | |
| VR1 | EVD06510B24G | 20kΩ B, Main Volume | 1 |
| **CAPACITORS** | | | |
| C1 | ECRR1H104ZF | 0.1μF | 1 |

## ME MIXING & EFFECT CIRCUIT

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| **INTEGRATED CIRCUITS** | | | |
| IC1 | SVIGT74H4051 | 8-channel Multiplexer | 1 |
| S IC2, 5~7, 10~12, 22, 23, 29 | SVIGM5218L | Operational Amplifier | 10 |
| IC8 | SVIGLM1894N | Dynamic Noise Reduction | 1 |
| IC9 | SVIGM5241L | Dual VCA | 1 |

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| **TRANSISTORS** | | | |
| Q3, 5 | 2SC3940ARS | Transistor | 2 |
| Q4, 6 | 2SA1534ARS | Transistor | 2 |
| S Q7 | 2SA1015-GR | 2SA933STRS (SUB. Part) | 1 |
| S Q8, 9 | 2SC1815GR | Transistor | 2 |
| **DIODES** | | | |
| D1 | EK04 | Diode | 1 |
| **RESISTORS** | | | |
| R1~9 | ERDS2TJ101 | 100Ω | 9 |
| R27 | ERDS2TJ474 | 470kΩ | 1 |
| R28 | ERDS2TJ124 | 120kΩ | 1 |
| R29 | ERDS2TJ154 | 150kΩ | 1 |
| R30 | ERDS2TJ332 | 3.3kΩ | 1 |
| R41, 42 | ERDS2TJ823 | 82kΩ | 2 |
| R47 | ERDS2TJ224 | 220kΩ | 1 |
| R52~54 | ERDS2TJ473 | 47kΩ | 3 |
| R56, 57 | ERDS2TJ104 | 100kΩ | 2 |
| R58~60 | ERDS2TJ473 | 47kΩ | 3 |
| R64~66 | ERDS2TJ104 | 100kΩ | 3 |
| R67 | ERDS2TJ472 | 4.7kΩ | 1 |
| R68 | ERDS2TJ222 | 2.2kΩ | 1 |
| R69 | ERDS2TJ472 | 4.7kΩ | 1 |
| R70~72 | ERDS2TJ333 | 33kΩ | 3 |
| R73 | ERDS2TJ472 | 4.7kΩ | 1 |
| R74 | ERDS2TJ222 | 2.2kΩ | 1 |
| R75 | ERDS2TJ472 | 4.7kΩ | 1 |
| R76~78 | ERDS2TJ333 | 33kΩ | 3 |
| R80 | ERDS2TJ331 | 330Ω | 1 |
| R83, 84 | ERDS2TJ472 | 4.7kΩ | 2 |
| R85 | ERDS2TJ331 | 330Ω | 1 |
| R86 | ERDS2TJ681 | 680Ω | 1 |
| R89 | ERDS2TJ682 | 6.8kΩ | 1 |
| R90 | ERDS2TJ152 | 1.5kΩ | 1 |
| R91, 93 | ERDS2TJ103 | 10kΩ | 2 |
| R97 | ERDS2TJ333 | 33kΩ | 1 |
| R98 | ERDS2TJ224 | 220kΩ | 1 |
| R100 | ERDS2TJ222 | 2.2kΩ | 1 |
| R103 | ERDS2TJ220 | 22Ω | 1 |
| R104 | ERDS2TJ224 | 220kΩ | 3 |
| R106, 107 | ERDS2TJ224 | 220kΩ | 3 |
| R108 | ERDS2TJ220 | 22Ω | 1 |
| R109 | ERDS2TJ224 | 220kΩ | 2 |
| R111 | ERDS2TJ224 | 220kΩ | 2 |
| R116 | ERDS2TJ333 | 33kΩ | 1 |
| R117 | ERDS2TJ124 | 120kΩ | 1 |
| R119 | ERDS2TJ103 | 10kΩ | 1 |
| R120 | ERDS2TJ333 | 33kΩ | 1 |
| R121 | ERDS2TJ124 | 120kΩ | 1 |
| R132 | ERDS2TJ684 | 680kΩ | 1 |
| R146 | ERDS2TJ104 | 100kΩ | 1 |
| R147 | ERDS2TJ103 | 10kΩ | 1 |
| R148 | ERDS2TJ333 | 33kΩ | 1 |
| R149 | ERDS2TJ103 | 10kΩ | 1 |
| R150 | ERDS2TJ333 | 33kΩ | 1 |
| R151 | ERDS2TJ103 | 10kΩ | 1 |
| R154 | ERDS2TJ683 | 68kΩ | 1 |
| R157 | ERDS2TJ154 | 150kΩ | 1 |
| R159 | ERDS2TJ104 | 100kΩ | 2 |
| R211 | ERDS2TJ104 | 100kΩ | 2 |
| R212 | ERDS2TJ223 | 22kΩ | 1 |
| R213, 214 | ERDS2TJ473 | 47kΩ | 2 |
| R215 | ERDS2TJ153 | 15kΩ | 1 |
| R216 | ERDS2TJ333 | 33kΩ | 1 |
| R217 | ERDS2TJ223 | 22kΩ | 1 |

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| R250, 251 ⚠ | ERD2FCVG100 | 10Ω, 1/4W, Fuse Type | 2 |
| R300 | ERDS2TJ105 | 1MΩ | 1 |
| R306, 307 ⚠ | ERD2FCVJ4R7 | 4.7Ω, 1/4W, Fuse Type | 2 |
| R311 | ERDS2TJ221 | 220Ω | 1 |
| R316 | ERDS2TJ102 | 1kΩ | 1 |
| R318 | ERDS2TJ331 | 330Ω | 1 |
| **CAPACITORS** | | | |
| C2 | ECEA0JKA470 | 47μF, 6.3V | 1 |
| C3 | ECQG1H332KZ | 0.0033μF | 1 |
| C28 | ECQM1H103KV | 0.01μF | 1 |
| C29 | ECKR1E473ZV | 0.047μF | 1 |
| C32~39 | ECQG1H222KZ | 0.0022μF | 8 |
| C40 | ECQG1H152KZ | 0.0015μF | 1 |
| C41 | ECCR1H680J | 68pF | 1 |
| C42 | ECQG1H152KZ | 0.0015μF | 1 |
| C43 | ECCR1H680J | 68pF | 1 |
| C44 | ECRR1H104ZF | 0.1μF | 1 |
| C45, 46 | ECQG1H152KZ | 0.0015μF | 2 |
| C47 | ECCR1H681J | 680pF | 1 |
| C48 | ECQG1H332KZ | 0.0033μF | 1 |
| C49 | ECCR1H681J | 680pF | 1 |
| C50 | ECCR1H101J | 100pF | 1 |
| C51 | ECCR1H680J | 68pF | 1 |
| C52 | ECQG1H332KZ | 0.0033μF | 1 |
| C53 | ECEA1HKA010 | 1μF, 50V | 1 |
| C54 | ECQG1H102KZ | 0.001μF | 1 |
| C55 | ECRR1H104ZF | 0.1μF | 1 |
| C57, 58 | ECEA1CU470 | 47μF, 16V | 2 |
| C59 | ECQM1H473KV | 0.047μF | 1 |
| C60 | ECKR1E473ZV | 0.047μF | 1 |
| C62 | ECEA1CU470 | 47μF, 16V | 1 |
| C63 | ECEA1HKA010 | 1μF, 50V | 1 |
| C64 | ECQG1H472KZ | 0.0047μF | 1 |
| C65 | ECRR1H104ZF | 0.1μF | 1 |
| C66, 67 | ECEA1HKN010 | 1μF, 50V | 2 |
| C80, 81 | ECCR1H220J | 22pF | 2 |
| C84 | ECQG1H332KZ | 0.0033μF | 1 |
| C86 | ECQV1H474JZ | 0.47μF | 1 |
| C87 | ECKR1E473ZV | 0.047μF | 1 |
| C90 | ECCR1H470J | 47pF | 1 |
| C94 | ECCR1H101J | 100pF | 1 |
| C96, 97 | ECQG1H102KZ | 0.001μF | 2 |
| C98, 99 | ECCR1H471J | 470pF | 2 |
| C130 | ECQG1H222KZ | 0.0022μF | 1 |
| C132 | ECQG1H472KZ | 0.0047μF | 1 |
| C133 | ECQM1H223KV | 0.022μF | 1 |
| C134 | ECQG1H102KZ | 0.001μF | 1 |
| C135 | ECQB1H103JZ | 0.01μF | 1 |
| C143, 145 | ECEA1CU470 | 47μF, 16V | 2 |
| C147 | ECQG1H682KZ | 0.0068μF | 1 |
| C148 | ECQV1H473JZ | 0.047μF | 1 |
| C150 | ECKR1E473ZV | 0.047μF | 1 |
| C170 | ECQG1H222KZ | 0.0022μF | 1 |
| C171 | ECEA1CU331 | 330μF, 16V | 1 |
| C172 | ECEA1CU470 | 47μF, 16V | 1 |
| C219 | ECQG1H222KZ | 0.0022μF | 1 |

## JK JACK CIRCUIT

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| **INTEGRATED CIRCUITS** | | | |
| IC1 | SVIGTLP513 | Photo Coupler | 1 |
| **TRANSISTORS** | | | |
| S Q1, 2 | 2SA1015-GR | 2SA933STRS (SUB. Part) | 2 |
| **DIODES** | | | |
| D1~5 | MA165TA5 | Diode | 5 |
| **COILS & LINE FILTERS** | | | |
| L1~3 | QLQGT3T150SA | Coil | 3 |
| **JACKS** | | | |
| JK1, 2 | SJJG100A | Jack, HEADPHONES 1, 2 | 2 |
| JK3, 5 | QJJG003AA | Jack, LINE OUT , AUX IN | 2 |
| JK7~9 | SJSG1370A | MIDI (THRU, OUT, IN) | 3 |
| **RESISTORS** | | | |
| R1 | ERDS2TJ104 | 100kΩ | 1 |
| R2 | ERDS2TJ221 | 220Ω | 1 |
| R3 | ERDS2TJ104 | 100kΩ | 1 |
| R4 | ERDS2TJ221 | 220Ω | 1 |
| R5 | ERDS2TJ103 | 10kΩ | 1 |
| R6 | ERDS2TJ221 | 220Ω | 1 |
| R7 | ERDS2TJ331 | 330Ω | 1 |
| R8~11 ⚠ | ERG1ANJP680S | 68Ω, 1W, Flame-Proof | 4 |
| R12, 13 | ERDS2TJ101 | 100Ω | 2 |
| **CAPACITORS** | | | |
| C1 | ECKR1E473ZV | 0.047μF | 1 |
| C2 | ECEA0JKA470 | 47μF, 6.3V | 1 |
| C3, 4 | ECCR1H221J | 220pF | 1 |
| C5 | ECQM1H103KV | 0.01μF | 1 |
| C7 | ECRR1H104ZF | 0.1μF | 1 |
| C8 | ECQG1H222KZ | 0.0022μF | 1 |
| C10 | ECQG1H222KZ | 0.0022μF | 1 |
| C11, 12 | ECRR1H104ZF | 0.1μF | 2 |
| C13, 14 | ECQG1H222KZ | 0.0022μF | 2 |
| **WIRES** | | | |
| ○ W1, 2 | QEXGRA01009A | Wire | 2 |

## CPSL CONTROL PANEL CIRCUIT

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| **INTEGRATED CIRCUITS** | | | |
| IC1 | SVIGM603A121 | Gate Array | 1 |
| ○ IC2, 4 | HD74LS07P | Hex Buffers | 2 |
| ○ IC3, 5 | M74LS07FP | Hex Buffers | 2 |
| IC6 | SVIGUPD7225 | LCD Driver | 1 |
| **TRANSISTORS** | | | |
| Q1~4 | 2SA630SB | Transistor | 4 |

## ACP POWER SUPPLY CIRCUIT

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| **DIODES** | | | |
| D3~82 | MA165TA5 | Diode | 80 |
| D103~106, 110~116, 119~123, 125, 127~131, 133, 135~142, 146, 148~155, 158~163, 166~171, 173~177, 179, 181, 183~186 | LN282R | LED (Red) | 65 |
| D124, 147, 180, 182 | LN382G | LED (Green) | 4 |
| **DISPLAYS** | | | |
| LD1 | SXEG101A | LCD Display | 1 |
| **COMPONENT COMBINATIONS** | | | |
| Z1 | EXBPI8103JM | 10kΩ × 8 | 1 |
| **SWITCHES** | | | |
| S3~9, 11~23, 25~30, 32~36, 38~47, 51~58, 61~66, 69~74, 76~94 | SSHG1049A | Push Switch | 80 |
| **IC PROTECTOR** | | | |
| IP1 △ | ICP-N10T104 | IC Protector | 1 |
| **RESISTORS** | | | |
| R1 | ERDS2TJ184 | 180kΩ | 1 |
| R2 | ERDS2TJ221 | 220Ω | 1 |
| R3 | ERDS2TJ222 | 2.2kΩ | 1 |
| R5 | ERDS2TJ102 | 1kΩ | 1 |
| R13~16 | ERDS2TJ103 | 10kΩ | 4 |
| R21~24 | ERDS2TJ680 | 68Ω | 4 |
| R25 | ERDS2TJ472 | 4.7kΩ | 1 |
| R26~42 | ERDS2TJ680 | 68Ω | 17 |
| R43 | ERDS2TJ184 | 180kΩ | 1 |
| R44, 46 | ERDS2TJ472 | 4.7kΩ | 2 |
| **CAPACITORS** | | | |
| C1 | ECEA0JKA470 | 47µF, 5.3V | 1 |
| C2 | ECCR1H101J | 100pF | 1 |
| ○ C4 | ECBA1C682MR5 | 0.0068µF | 1 |
| C5 | ECCR1H101J | 100pF | 1 |
| C6~9 | ECRR1H104ZF | 0.1µF | 4 |
| ○ C12 | ECBA1H101KB5 | 100pF | 1 |

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| **COILS & LINE FILTERS** | | | |
| L1 △ | SLTGLF3 | Line Filter | 1 |
| **JACKS** | | | |
| JK1 △ | SJVD0203B | AC Inlet | 1 |
| JK2 | QJSG002AA | Jack | 1 |
| **SWITCHES** | | | |
| S1 [E] [X] △ [XS] [E2] | SSRG100A | Voltage Selector | 1 |
| **FUSES** | | | |
| F1 [E] [M] △ [E2] | XBA1C40NU100 | 4A, 125V | 1 |
| F1 [E] [X] △ [XS] [E2] | XBA2C20TB0 | T2A, 250V | 1 |
| F2 △ | XBA2C12TB0 | T1.25A, 250V | 1 |
| F3 Others △ | XBA2C12TB0 | T1.25A, 250V | 1 |
| ○ F3 | XBA2C10TB0 | T1.0A, 250V | 1 |
| **CAPACITORS** | | | |
| C1 △ | ECQU2A104MN | 0.1µF, 250V, Across-the Line Capacitor | 1 |
| C2 △ | ECKCVA1472MF | 4700pF, Line-Capacitor | 1 |
| C3 | ECRR1H104ZF | 0.1µF | 1 |
| **WIRES** | | | |
| ○ W1 | SWEG860A | Wire | 1 |
| **AC INLET COVER** | | | |
| [X] [E] △ | SJS9334A | AC Inlet Cover | 1 |
| Others △ | SJS9231A | AC Inlet Cover | 1 |

## AS AMP & POWER SUPPLY CIRCUIT

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| **INTEGRATED CIRCUITS** | | | |
| IC1 | SVIGM5291P | Switching Regulator | 1 |
| IC2 | SVIGM5F7815 | +15V Voltage Regulator | 1 |
| IC3 | SVIGM5F7915 | −15V Voltage Regulator | 1 |
| **TRANSISTORS** | | | |
| Q1 | 2SA1643 | Transistor | 1 |
| S Q2 | 2SA1015-GR | 2SA933STRS (SUB. Part) | 1 |
| S Q3, 4, 8 | 2SC1815GR | Transistor | 3 |
| Q5 | 2SA1123S | Transistor | 1 |
| Q6 | 2SD1277A | Transistor | 1 |
| Q7 | 2SB951A | Transistor | 1 |
| **DIODES** | | | |
| S D1, 3, 5, 7 △ | SVDGS3V20-15 | Rectifier | 4 |
| ○ D9, 10 △ | SVDGERA1502 | Rectifier | 2 |
| D11 | SVDGRK14S | Diode | 1 |
| D12 | MA2062LF | Zener, 6.2V | 1 |
| D13, 14 | MA165TA5 | Diode | 2 |
| D15 | MA4062 | Zener, 6.2V | 1 |

## MKBU UPPER MANUAL KEYBOARD CIRCUIT

| Ref. No. | | Part No. | Description | Per/Set |
|---|---|---|---|---|
| **COILS & LINE FILTERS** | | | | |
| ○ L1 | | QLCGTJR10KA | Coil | 1 |
| **RELAYS** | | | | |
| RL1 | | SSYGMR30112 | Relay | 1 |
| **IC PROTECTOR** | | | | |
| ○ IP1, 2 | △ | ICP-N50T104 | IC Protector | 2 |
| **RESISTORS** | | | | |
| R1, 2 | | ERDS2TJ103 | 10kΩ | 2 |
| R3 | △ | ERQ14AJ2R0 | 2Ω, 1/4W, Fuse Type | 1 |
| R4 | △ | ERX1ANJPR22S | 0.22Ω, 1W, Flame-Proof | 1 |
| R5 | | ERDS2TJ101 | 100Ω | 1 |
| R6 | | ERDS2TJ471 | 470Ω | 1 |
| R7 | | ERDS2TJ470 | 47Ω | 1 |
| R8 | △ | ERG1ANJP221S | 220Ω, 1W, Flame-Proof | 1 |
| R9 | | ER0S2TKF1001 | 1kΩ, ±1% | 1 |
| R10 | | ER0S2TKF3571 | 3.57kΩ, ±1% | 1 |
| R11 | | ERDS2TJ331 | 330Ω | 1 |
| R13 | △ | ERG2ANJP681S | 680Ω, 2W, Flame-Proof | 1 |
| R14 | | ERDS2TJ103 | 10kΩ | 1 |
| R15 | | ERDS2TJ472 | 4.7kΩ | 1 |
| R16 | | ERDS2TJ103 | 10kΩ | 1 |
| R17 | | ERDS2TJ332 | 3.3kΩ | 1 |
| R18 | | ERDS2TJ472 | 4.7kΩ | 1 |
| R19 | | ERDS2TJ103 | 10kΩ | 1 |
| R20 | | ERDS2TJ152 | 1.5kΩ | 1 |
| R21 | | ERDS2TJ223 | 22kΩ | 1 |
| R22 | | ERDS2TJ102 | 1kΩ | 1 |
| R23 | | ERDS2TJ682 | 6.8kΩ | 1 |
| R24 | | ERDS2TJ472 | 4.7kΩ | 1 |
| R25 | | ERDS2TJ153 | 15kΩ | 1 |
| R26, 27 | | ERDS2TJ222 | 2.2kΩ | 2 |
| R28, 29 | △ | ERX2ANJPR22S | 0.22Ω, 2W, Flame-Proof | 2 |
| R30 | △ | ERD25FVJ4R7 | 4.7Ω, 1/4W, Flame-Proof | 1 |
| **CAPACITORS** | | | | |
| C2, 3 | | ECEA1VU332 | 3300μF, 35V | 2 |
| C6 | | ECEA1VKG100 | 10μF, 35V | 1 |
| C7 | | ECCR1H101J | 100pF | 1 |
| C8, 9 | | ECEA0JU102 | 1000μF, 6.3V | 2 |
| C15, 16 | | ECEA1VKG100 | 10μF, 35V | 2 |
| C17 | | ECKR1E473ZV | 0.047μF | 1 |
| C18 | | ECEA1HKN010 | 1μF, 50V | 1 |
| C19 | | ECQG1H472KZ | 0.0047μF | 1 |
| C21 | | ECEA0JKA470 | 47μF, 6.3V | 1 |
| C22 | | ECEA1VKG100 | 10μF, 35V | 1 |
| C23 | | ECCR1H101J | 100pF | 1 |
| C24 | | ECCR1H221J | 220pF | 1 |
| C25 | | ECRR1H104ZF | 0.1μF | 1 |
| C26 | | ECEA50Y1R5 | 1.5μF, 50V | 1 |
| ○ C35 | | ECEA50Y8R2 | 8.2μF, 50V | 1 |

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| **INTEGRATED CIRCUIT** | | | |
| IC1 | MN50020PGV | Gate Array | 1 |
| **DIODES** | | | |
| S D1~88 | MA162A | MA150IR (SUB. Part) | 88 |
| **OSCILLATOR** | | | |
| X1 | EF0FC4004A3 | 4MHz, Ceramic Oscillator | 1 |
| **COMPONENT COMBINATION** | | | |
| Z1 | EXBPI8472JM | 4.7kΩ×8 | 1 |
| **SWITCHES** | | | |
| S1~7, 38~44 | SSPG7004A | Rubber Switch (7 pcs. on one) | 2 |
| S8~37 | SSPG6004A | Rubber Switch (6 pcs. on one) | 5 |
| **CAPACITORS** | | | |
| C2 | ECRR1H104ZF | 0.1μF | 1 |
| C3 | ECCR1H471J | 470pF | 1 |
| C4 | ECEA0JKA470 | 47μF, 6V | 1 |

## MKBL LOWER MANUAL KEYBOARD CIRCUIT

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| **DIODES** | | | |
| S D1~88 | MA162A | MA150IR (SUB. Part) | 88 |
| **SWITCHES** | | | |
| S45~51, 82~88 | SSPG7004A | Rubber Switch (7 pcs. on one) | 2 |
| S52~81 | SSPG6004A | Rubber Switch (6 pcs. on one) | 5 |

## PKB PEDAL KEYBOARD CIRCUIT

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| **TRANSISTORS** | | | |
| S Q1, 2, 4 | 2SA1015-GR | 2SA933STRS (SUB. Part) | 3 |
| S Q5~17 | 2SC2320LFG | 2SC1310FG (SUB. Part) | 13 |
| **SWITCHES** | | | |
| S1~13 | SHGG50A | Rubber Switch (5 pcs. on one) | 3 |



| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| **RESISTORS** | | | |
| R1, 2 | ER0S2CKF4700 | 470Ω, ±1% | 2 |
| R3 | ERDS2TJ472 | 4.7kΩ | 1 |
| R5 | ER0S2CKF4700 | 470Ω, ±1% | 1 |
| R7 | ERDS2TJ472 | 4.7kΩ | 1 |
| R8 | ERDS2TJ103 | 10kΩ | 1 |
| R9 | ERDS2TJ472 | 4.7kΩ | 1 |
| R10 | ERDS2TJ103 | 10kΩ | 1 |
| R11 | ERDS2TJ472 | 4.7kΩ | 1 |
| R12 | ERDS2TJ103 | 10kΩ | 1 |
| R13 | ERDS2TJ472 | 4.7kΩ | 1 |
| R14 | ERDS2TJ103 | 10kΩ | 1 |
| R15 | ERDS2TJ472 | 4.7kΩ | 1 |
| R16 | ERDS2TJ103 | 10kΩ | 1 |
| R17 | ERDS2TJ472 | 4.7kΩ | 1 |
| R18 | ERDS2TJ103 | 10kΩ | 1 |
| R19 | ERDS2TJ472 | 4.7kΩ | 1 |
| R20 | ERDS2TJ103 | 10kΩ | 1 |
| R21 | ERDS2TJ472 | 4.7kΩ | 1 |
| R22 | ERDS2TJ103 | 10kΩ | 1 |
| R23~29 | ER0S2CKF4700 | 470Ω, ±1% | 7 |
| R30 | ER0S2CKF1001 | 1kΩ, ±1% | 1 |
| R32 | ERDS2TJ472 | 4.7kΩ | 1 |
| R33 | ERDS2TJ103 | 10kΩ | 1 |
| R34 | ERDS2TJ472 | 4.7kΩ | 1 |
| R35 | ERDS2TJ103 | 10kΩ | 1 |
| R36 | ERDS2TJ472 | 4.7kΩ | 1 |
| R37 | ERDS2TJ103 | 10kΩ | 1 |
| R38 | ERDS2TJ472 | 4.7kΩ | 1 |
| R39 | ERDS2TJ103 | 10kΩ | 1 |
| R40 | ERDS2TJ472 | 4.7kΩ | 1 |
| R41 | ERDS2TJ103 | 10kΩ | 1 |
| R42~45 | ER0S2CKF4700 | 470Ω, ±1% | 4 |
| R46 | ER0S2CKF2201 | 2.2kΩ, ±1% | 1 |
| R51 | ERDS2TJ472 | 4.7kΩ | 1 |

## EXP EXPRESSION CIRCUIT

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| **CDS** | | | |
| CS1 | SVEG5 | Light Sensitive Device | 1 |



## ■ WIRING PARTS

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| ○ W1 | QEXGSA04075A | Connector with Wire | 1 |
| ○ W2 | QEXGSA08070A | Connector with wire | 1 |
| ○ W3 | QEXGSA10080A | Connector with wire | 1 |
| ○ W4 | QEXGSS11035A | Connector with wire | 1 |
| ○ W5 | QEXGSS08035A | Connector with wire | 1 |
| ○ W6 | QEXGSS13030A | Connector with wire | 1 |
| ○ W7 | QEXGSS03055A | Connector with wire | 1 |
| ○ W8 | QEXGSS09100A | | 1 |
| ○ W9 | QEXGSS08070B | Connector with wire | 1 |
| ○ W10 | QEXGSS05045A | Connector with Wire | 1 |
| ○ W11 | QEXGVH03120B | Connector with Wire | 1 |
| ○ W12 | QEXGSS12045A | Connector with wire | 1 |
| ○ W13 | QEXGVH07015B | | 1 |
| ○ W14 | QEXGVH05080B | Connector with wire | 1 |
| ○ W15 | QEXGZA08100A | Pedal Cable | 1 |
| ○ W16 | QEXGVH08120B | | 1 |
| W17 | SWKG0326LTA | Connector with Wire | 1 |
| ○ W18 | SWKG04156LSA | Connector with wire | 1 |
| ○ W19 | QEXGEL03045B | Speaker Code | 1 |
| W20~22 | SWEG510A | | 3 |

# REPLACEMENT PARTS LIST.....P.C.B. and Wiring Parts

**Notes:**

1. Printed circuit boards assembly with mark (NLA is no longer available after production discontinuation of the complete set.
2. Important safety notice
   Components identified by △ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "S" mark is service standard parts and may differ from production parts.
4. ○ mark are new parts.
5. For part No. with area mark, check the area when placing an order.

## ■ CABINET & CHASSIS PARTS

| | Ref. No. | | Part No. | Description | Per/Set |
|---|---|---|---|---|---|
| | | | **POWER SWITCH** | | |
| | S1 | △ | SSHG1050A | Power Switch | 1 |
| | | | **SPEAKERS** | | |
| | SP1 | | SASG16PL01-F | Speaker, 16cm 4Ω | 1 |
| | SP2 | | EAS15S09A | Speaker, 13×6cm 8Ω | 1 |
| | SP3 | | EAS85PH89A | 6.5cm, 12Ω | 1 |
| | | | **TRANSFORMER** | | |
| ○ | T1 [M] [MC] △ [EK] | | QTPG1M008A | Power Transformer | 1 |
| ○ | T1 [E] [K] △ [EB] [EG] [EV] | | QTPG1M011A | Power Transformer | 1 |
| ○ | TI Other areas △ | | QTPG1M010A | Power Transformer | 1 |
| | | | **POWER CORD & PLUG** | | |
| | PC1 [EK] [ES] △ [EV] | | QJAG001AA | AC Power Cord | 1 |
| | PC1 [EL] [EB] △ [AM] | | SJAG61 | AC Power Cord | 1 |
| | PC1 [M] [MC] △ [AM] | | SJAG62 | AC Power Cord | 1 |
| | PC1 [EH] [EJ] △ [EG] [EC] [EP] [EE] [EN] [K] | | SJAG65 | AC Power Cord | 1 |
| | PC2 | [K] △ | SJP5213-1 | Attachment Plug | 1 |
| | PC3 | [XD] △ | SJPG1350A | Power Plug | 1 |
| | | | **CABINET PARTS** | | |
| ○ | 1 | | QYAG2003AA | Music Rack Ass'y | 1 |
| ○ | 2 | | QKQGA041AA | Top Cover | 1 |
| ○ | 2-1 | | QMRG7021AA | Sleeve | 2 |
| | 2-2 | | SGBG160A | Technics Badge | 1 |
| ○ | 3 | | QGPG0033CA | Control Panel , Left | 1 |
| ○ | 4 | | QGPG0034BA | Control Panel , Right | 1 |
| ○ | 5 | | QKWG004AA | Display Cover Panel | 1 |
| ○ | 6 | | QMFG4054AA | Felt | 1 |
| ○ | 7 | | QMFG4055AA | Felt | 1 |
| | 8 | | QYP91015BA | Jack Panel | 1 |
| | 9 | | SNEG1700A | Latch | 6 |
| ○ | 10 | | QMRG2018AA | Plastic Cover | 1 |
| ○ | 11 | | QGKG0056AA | Ornament | 1 |
| ○ | 12 | | QSCG937A | Shield Parts | 1 |
| ○ | 13 | | QKQGD024AA | Rear Bord , Upper Cabinet | 1 |
| ○ | 14 | [EJ] [K] [EB] [AS] [XD] [XB] | SMKG3483A | AC Panel | 1 |
| ○ | 14 | | SMKG3482A | AC Panel | 1 |
| ○ | 15 | | QKSGE001CA | Ornament | 1 |
| | 16 | | SHSG2870A | Felt | 1 |
| | 17 | | QMFG1057AA | Felt | 2 |
| | 18 | | SUWG3010A | Bracket | 2 |
| ○ | 19 | | SUWG3001A | Bracket | 2 |
| ○ | 20 | | QKUG1015AAK | Rear Bord , Speaker Box | 1 |
| | 21 | | SHRG1110A | Cord Clamper | 1 |
| | 22 | | SHRG1120A | Cord Clamper | 1 |
| | 23 | | SUWG3020A | Bracket | 2 |

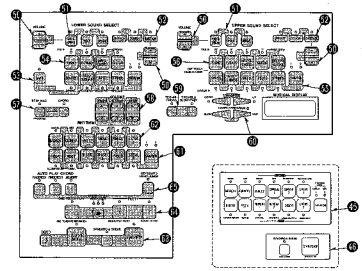
| | Ref. No. | | Part No. | Description | Per/Set |
|---|---|---|---|---|---|
| ○ | 24 | | QKUG1016AA | Rear Bord , Lower Cabinet | 1 |
| ○ | 25 | | QMFG4057AA | Felt | 1 |
| ○ | 26 | | QKQGM021AA | Pedal Box Ass'y | 1 |
| ○ | 26-1 | | QKAG0004AA | Foot | 1 |
| ○ | 28 | | QKQGB146AAK | Left Plank | 1 |
| ○ | 29 | | QKQGB147AAK | Right Plank | 1 |
| | 30 | | SUWG3350A | Bracket | 1 |
| | 31 | | SUWG3351A | Bracket | 1 |
| ○ | 32 | | SUWG3340A | Bracket | 4 |
| ○ | 33 | | QMFG1069AA | Felt | 2 |
| ○ | 34 | | QEXGEL03045B | Speaker Code | 1 |
| ○ | 35 | | QEXGZA08100A | Pedal Cable | 1 |
| | 36 | | SHRG0620A | Cord Clamper | 2 |
| ○ | 37 | [M] [MC] | SKLG2953B | Leg, Left | 1 |
| ○ | 37 | | SKLG2829B | Leg, Left | 1 |
| ○ | 38 | [M] [MC] | SKLG2953B | Leg, Right | 1 |
| ○ | 38 | | SKLG2928B | Leg, Right | 1 |
| | 39 | | SUWG3360A | Bracket | 2 |
| | 40 | | SXVG5110A | Expression Pedal | 1 |
| | 40-1 | | SSHG14 | Foot Switch | 1 |
| | 40-2 | | RJS205ZA | Socket | 1 |
| | 40-3 | | SHGG908 | Lamp Holding Rubber | 1 |
| | 40-4 | | XAMR55P | Lamp | 1 |
| ○ | 41 | | QGKG0058AA | Ornament | 1 |
| ○ | 42 | | QMFG4051AA | Felt | 2 |
| ○ | 43 | | QMAG0068AA | Binder | 3 |
| | 44 | | SUWG219 | Binder | 7 |
| ○ | 45 | | QQLG037AA | MIDI Seal | 1 |
| ○ | 46 | | QQLG038AA | MIDI Seal | 1 |
| | 47 | [M] [MC] [MK] [ES] [EL] | SHRG1270A | Mounting Base | 2 |
| | 48 | [M] [MC] [MK] [ES] [EL] | SLQGTRCC20 | Core | 2 |
| ○ | 49 | | QKQGL018AA | Speaker Box | 1 |
| | | | **BUTTOUN** | | |
| ○ | 50 | | QGUG1122AA01 | Button | 4 |
| ○ | 51 | | QGUG1123AB01 | Button | 2 |
| ○ | 52 | | QGUG1124AA01 | Button | 2 |
| ○ | 53 | | QGUG1120BA01 | Button | 1 |
| ○ | 54 | | QGUG1121BA01 | Button | 1 |
| ○ | 55 | | QGUG1127BA01 | Button | 1 |
| ○ | 56 | | QGUG1128BA02 | Button | 1 |
| ○ | 57 | | QGUG1119AA | Button | 1 |
| ○ | 58 | | QGUG1125AA01 | Button | 1 |
| ○ | 59 | | QGUG1126AA | Button | 1 |
| ○ | 60 | | QGUG1107AA | Button | 1 |
| ○ | 61 | | QGUG1117BA01 | Button | 1 |
| ○ | 62 | | QGUG1118BA01 | Button | 1 |
| ○ | 63 | | QGUG1114AB01 | Button | 1 |
| ○ | 64 | | QGUG1115BA01 | Button | 1 |
| ○ | 65 | | QGUG1116BA | Button | 1 |
| | 66 | | SBNG7031A | Knob | 1 |
| | 67 | | QGUG1040AA | Button, Power Switch | 1 |
| | 68 | | SHGG50A | Rubber Switch (5 pcs. on one) | 1 |
| | 69 | | SHSG1600B | Felt | 1 |
| | 70 | | STBG4011A | Key Guide | 1 |

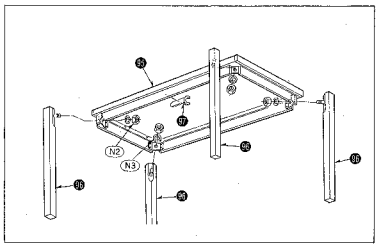


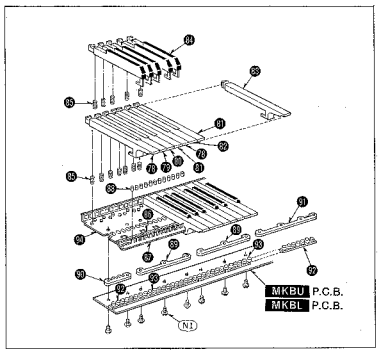
| | Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|---|
| | 71 | SHSG1460A | Felt | 1 |
| | 72 | STBG1091C | White Key | 8 |
| | 73 | STBG2052A | Black Key | 5 |
| | 74 | SUSG180A | Spring | 1 |
| | 75 | SHGG8130A | Rubber | 1 |
| | 76 | SHRG9240A | Spacer | 1 |
| | 77 | SHRG1230A | Cord Clamper | 1 |
| | | **MANUAL KEYBOARD** | | |
| | 78 | STBG1100A | White Key (C and F Key) | 14 |
| | 79 | STBG1130A | White Key (G Key) | 8 |
| | 80 | STBG1140A | White Key (A Key) | 8 |
| | 81 | STBG1120A | White Key (E and B Key) | 14 |
| | 82 | STBG1110A | White Key (D Key) | 6 |
| | 83 | STBG1150A | White Key (Top Octave C Key) | 2 |
| | 84 | STBG2070A | Black Key | 36 |
| | 85 | SUSG270A | Spring | 88 |
| | 86 | SHSG1931A | Felt | 2 |
| | 87 | SHSG3960A | Felt | 2 |
| | 88 | SHGG9050A | Key Guide Rubber | 88 |
| | 89 | SHRGA9010A | Spacer | 4 |
| ○ | 90 | SHRGA9021A | Spacer | 2 |
| | 91 | SHRGA9030A | Spacer | 2 |
| | 92 | SSPG7004A | Rubber Switch (7 pcs. on one) | 4 |
| | 93 | SSPG6004A | Rubber Switch (6 pcs. on one) | 10 |
| ○ | 94 | STBG6106A | Chassis | 2 |
| | | **BENCH** | | |
| ○ | 95 | QKQGA033AAK | Seat | 1 |
| ○ | 96 | QKQGZ044AAK | Leg | 4 |
| ○ | 97 | QFBG007AA | Spanner | 1 |
| | | **SCREWS & WASHERS** | | |
| | N1 | XTW3+10T | Screw | 22 |
| | N2 | XNH10G | Nut | 4 |
| | N3 | XWB10B | Washer | 4 |
| | N4 | XTB4+12A | Screw | 27 |
| | N5 | XTW3+10Q | Screw | 23 |
| | N6 | XYN5+C10 | Screw with Washer | 1 |
| | N7 | XTB3+5C | Screw | 24 |
| | N8 | SNEG770A | Washer | 4 |
| | N9 | XNS12FZ | Nut | 4 |
| ○ | N10 | XTB4+20A | Screw | 2 |
| | N11 | XTT35+25AFZ | Screw | 4 |
| | N12 | XTT4+16AFZ | Screw | 14 |
| | N13 | XTW3+8JFZ | Screw | 7 |
| | N14 | XTW3+6J | Screw | 8 |
| | N15 | XTB35+12A | Screw | 12 |
| | N16 | SNEG2660A | Screw | 1 |
| | N17 | XYN4+F14 | Screw with Washer | 4 |
| | N18 | QHD1606AA | Screw | 7 |
| | N19 | XSN5+85FVC | Screw | 1 |
| | N20 | XWA5B | Washer | 1 |
| | N21 | SNEG150A | Washer | 1 |
| | N22 | XTB3+8BFVC | Screw | 2 |
| | N23 | XTB35+20A | Screw | 4 |
| | N24 | XTT35+10AFC | Screw | 6 |
| | N25 [M] [MK] [MC] [EJ] [EL] | XTB3+12A | Screw | 1 |
| | N26 | SNEG2560A | Screw with Washer | 8 |
| | N27 | XTT35+30AFZ | Screw | 11 |
| | N28 | SNE499-1 | Nut | 4 |

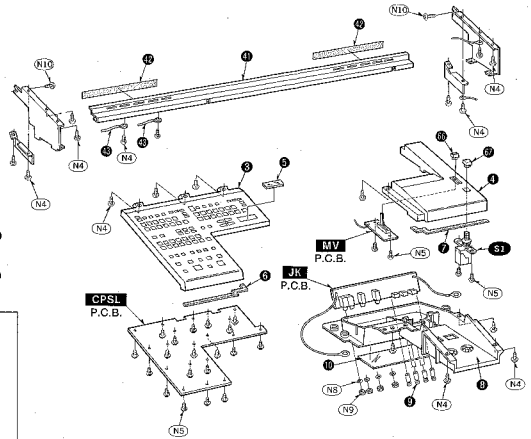
| | Ref. No. | | Part No. | Description | Per/Set |
|---|---|---|---|---|---|
| | N29 | | XYN3+F30 | Screw with Washer | 2 |
| | N30 | | XYN4+F20FZ | Screw with Washer | 6 |
| | N31 | | XYN4+F30 | Screw with Washer | 6 |
| | N32 | | XTT4+16A | Screw | 9 |
| | N33 | | XWA4B | Washer | 1 |
| | N34 | | XTB35+20A | Screw | 1 |
| ○ | N35 | | XYN35+F16 | Screw with Washer | 4 |
| | N36 | | XTB3+6B | Screw | 4 |
| | N37 | | XNG5BS | Nut | 1 |
| | N38 | | SNEG1720B | Bolt | 1 |
| | N39 | | XTB35+14A | Screw | 1 |
| | N40 | | XTN26+6B | Screw | 1 |
| | N41 | [M] [MK] [MC] [EJ] [EL] | XTB3+16A | Screw | 1 |

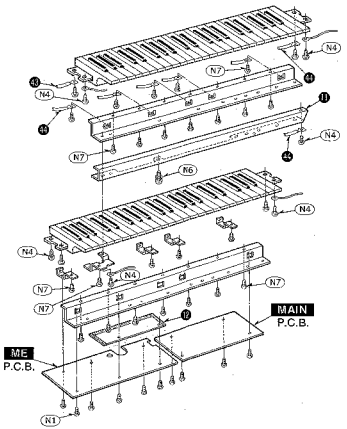
# CABINET PARTS LOCATION

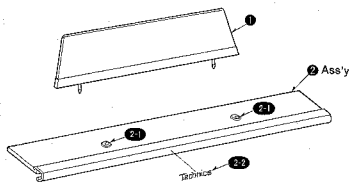


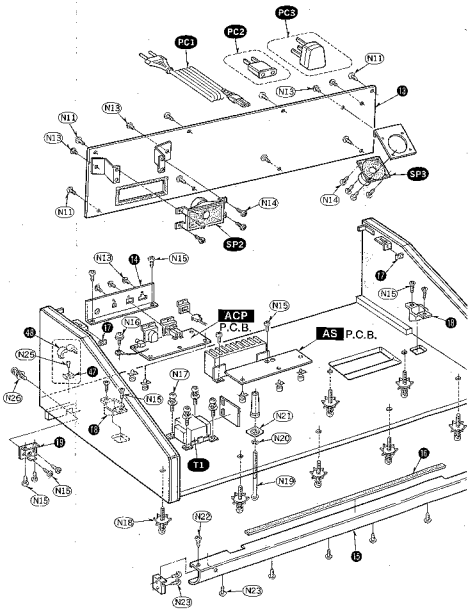




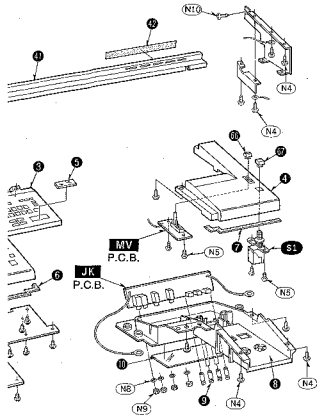




III-9

III-10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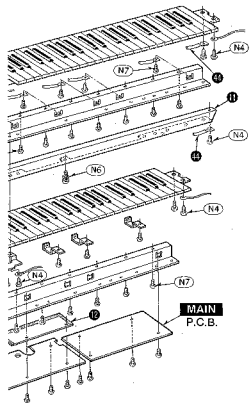
P.C.B.
JK
P.C.B.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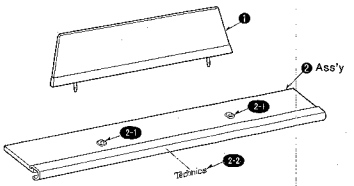
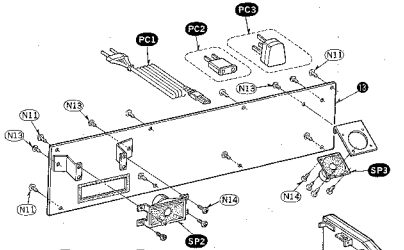
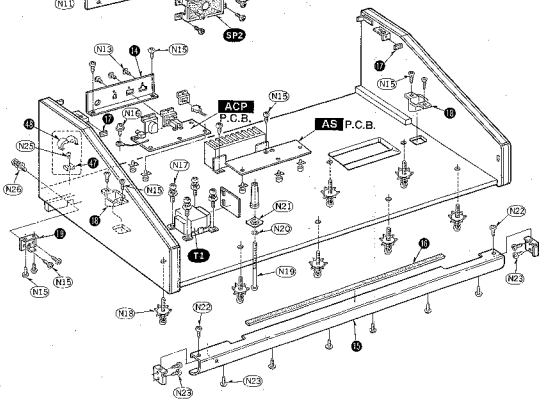

Ass'y
Technics


PC1
PC2
PC3
SP2
SP3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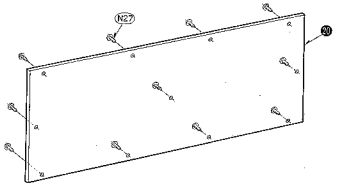
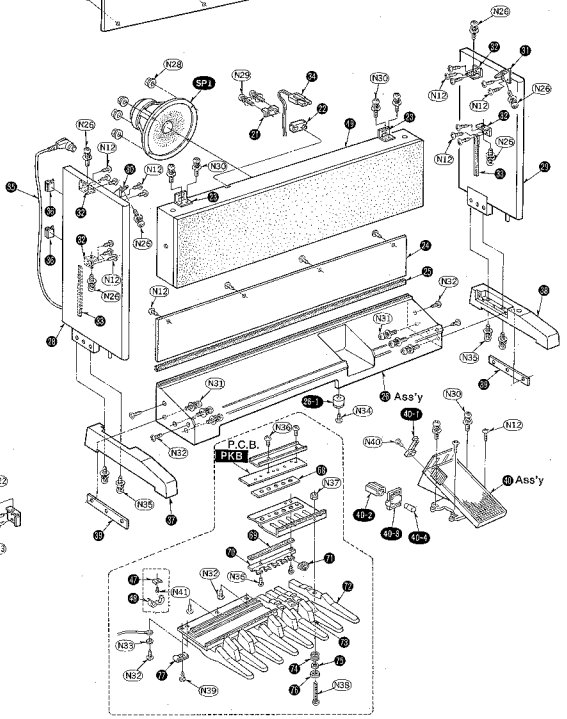
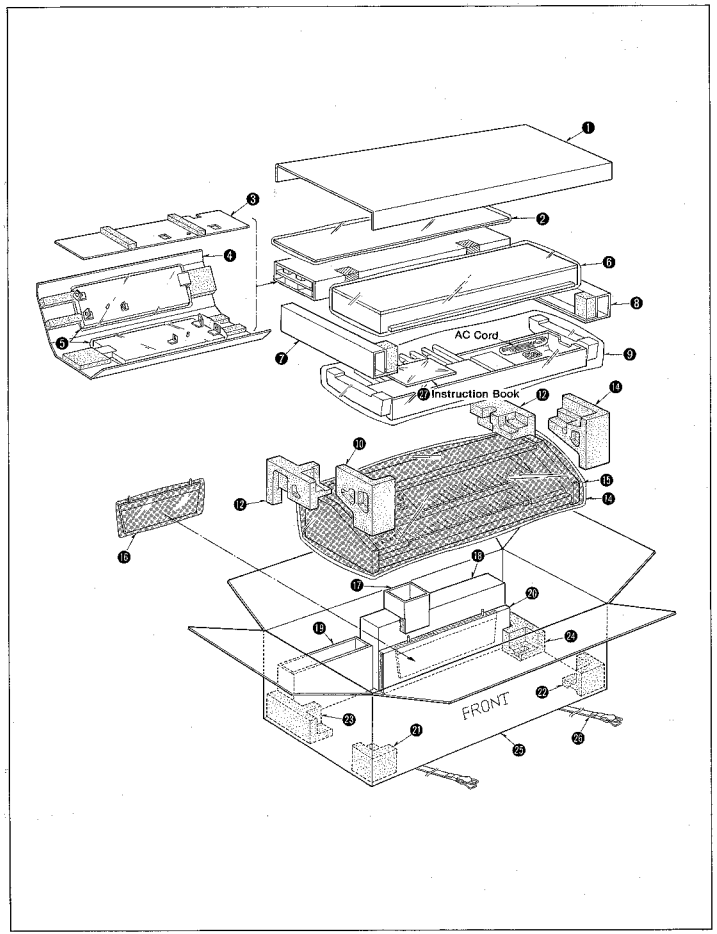
P.C.B.
AS
P.C.B.




SP1
Ass'y
P.C.B.
PKB
Ass'y

# PACKING




## ■ PACKING PARTS

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| 1 | QPGG0135AA | Top Case | 1 |
| 2 | SPHG1641A | Polyethylene Bag | 1 |
| 3 | QPNG0231AA | Pad | 1 |
| 4 | QPNG0230A | Carton Box, Plank | 1 |
| 5 | SPHG1641A | Polyethylene Bag | 2 |
| 6 | SPHG1630A | Polyethylene Bag | 1 |
| 7 | QPNG0252AA | Pad | 1 |
| 8 | QPNG0253AA | Pad | 1 |
| 9 | SPHG1630A | Polyethylene Bag | 1 |
| 10 | QPNG0241AA | Pad | 1 |
| 11 | QPNG0242AA | Pad | 1 |
| 12 | QPNG0243AA | Pad | 1 |
| 13 | QPNG0244AA | Pad | 1 |
| 14 | SPHG1110A | Polyethylene Bag | 1 |
| 15 | SPHG280A | Protection Sheet | 1 |
| 16 | SPHG610A | Protection Sheet | 1 |
| 17 | QPNG0232AA | Pad | 1 |
| 18 | QPZGM007A | Packing Case, Bench | 1 |
| 19 | QPGG0134AA | Pad | 1 |
| 20 | QPGG0120AA | Music Rack Case | 1 |
| 21 | QPNG0245AA | Pad | 1 |
| 22 | QPNG0246AA | Pad | 1 |
| 23 | QPNG0247AA | Pad | 1 |
| 24 | QPNG0248AA | Pad | 1 |
| 25 | QPGG0133AA | Carton Box | 1 |
| **INSTRUCTION BOOK** | | | |
| 28 B | QQFGEN4AA | Instruction Book | 1 |
| 28 M | QQFGEN4CA | Instruction Book | 1 |
| 28 U | QQFGEN4DA | Instruction Book | 1 |
| 28 EB EK | QQFGEN4EA | Instruction Book | 1 |
| 28 EK | QQFGEN4FA | Instruction Book | 1 |
| 28 E | QQFGEN4GA | Instruction Book | 1 |
| 28 GN | QQFGEN4HA | Instruction Book | 1 |
| 28 EF M | QQFGEN4JA | Instruction Book | 1 |
| 28 X | QQFGEN4KA | Instruction Book | 1 |
| 28 BK E M XS XE | QQFGEN4LA | Instruction Book | 1 |





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## ■ PACKING PARTS

| Ref. No. | Part No. | Description | Per/Set |
|---|---|---|---|
| 1 | QPGG0135AA | Top Case | 1 |
| 2 | SPHG1641A | Polyethylene Bag | 1 |
| 3 | QPNG0231AA | Pad | 1 |
| 4 | QPNG0230A | Carton Box, Plank | 1 |
| 5 | SPHG1641A | Polyethylene Bag | 2 |
| 6 | SPHG1630A | Polyethylene Bag | 1 |
| 7 | QPNG0252AA | Pad | 1 |
| 8 | QPNG0253AA | Pad | 1 |
| 9 | SPHG1630A | Polyethylene Bag | 1 |
| 10 | QPNG0241AA | Pad | 1 |
| 11 | QPNG0242AA | Pad | 1 |
| 12 | QPNG0243AA | Pad | 1 |
| 13 | QPNG0244AA | Pad | 1 |
| 14 | SPHG1110A | Polyethylene Bag | 1 |
| 15 | SPHG2180A | Protection Sheet | 1 |
| 16 | SPHG810A | Protection Sheet | 1 |
| 17 | QPNG0232AA | Pad | 1 |
| 18 | QPZGM007A | Packing Case, Bench | 1 |
| 19 | QPGG0134AA | Pad | 1 |
| 20 | QPGG0120AA | Music Rack Case | 1 |
| 21 | QPNG0245AA | Pad | 1 |
| 22 | QPNG0246AA | Pad | 1 |
| 23 | QPNG0247AA | Pad | 1 |
| 24 | QPNG0248AA | Pad | 1 |
| 25 | QPGG0133AA | Carton Box | 1 |
| **INSTRUCTION BOOK** | | | |
| 28 [B] | QQFGEN4AA | Instruction Book | 1 |
| 28 [M] | QQFGEN4CA | Instruction Book | 1 |
| 28 [MK] | QQFGEN4DA | Instruction Book | 1 |
| 28 [E] [EA] | QQFGEN4EA | Instruction Book | 1 |
| 28 [EM] | QQFGEN4FA | Instruction Book | 1 |
| 28 [EF] | QQFGEN4GA | Instruction Book | 1 |
| 28 [EH] | QQFGEN4HA | Instruction Book | 1 |
| 28 [E] [EN] | QQFGEN4JA | Instruction Book | 1 |
| 28 [X] | QQFGEN4KA | Instruction Book | 1 |
| 28 [ER] [XL] [XS] [XS] [XB] | QQFGEN4LA | Instruction Book | 1 |



A4 size